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A METHOD FOR THE EXAMINATION OF NEOARSPHENAMINE AND SULFARSPHENAMINE

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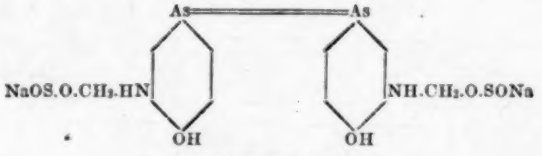
In continuing the previously reported work [1] on the development of simplified methods for determining the distribution of the sulfur in neoarsphenamine, it became apparent that it would be necessary to have some suitable method for differentiating between neoarsphenamine and sulfarsphenamine.[2] While carrying out some experiments with this object in view, it was found that although iodine in alkaline solution readily oxidizes nearly all of the sulfur of neoarsphenamine to sulfate, it apparently does not act the same way on the organically combined sulfur of sulfarsphenamine.

PROCEDURE

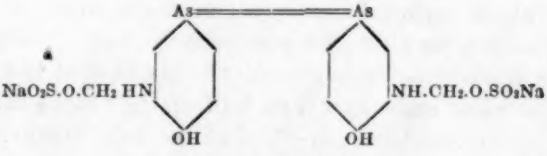
The procedure used in these experiments was as follows: 0.1 gram of the sample of neoarsphenamine or sulfarsphenamine was dissolved in 50 c. c. H_2O, placed in a 200 c. c. flask, and mixed with 50 c. c. 0.1 N iodine. This solution was then mixed with 10 c. c. 2N sodium hydroxide and allowed to stand at room-temperature for five minutes. At the end of that time, the solution was mixed with

[1] Jour. Ind. Eng. Chem., 14, 624 (1922); Pub. Health Repts., 39, 750-754 (1924).

[2] The following formulae are supposed to represent the chemical constitution of neoarsphenamine and sulfarsphenamine, respectively, if we assume that both amino groups of the arsphenamine base participate in the reactions:



NEOARSPHENAMINE



SULFARSPHENAMINE

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21 c. c. N hydrochloric acid and made up to the 200 c. c. mark with distilled water. There were then withdrawn 50 c. c. of the resulting solution and the free iodine was titrated with 0.1 N sodium thiosulfate, using starch as indicator. The remaining 150 c. c. were mixed with 20 or 30 c. c. of approximately 0.05 M sodium arsenite.[3] When the change in color indicated the completion of the reaction between the free iodine and the arsenite, the solution was transferred quantitatively into a 400 c. c. beaker. After adding 5 c. c. N hydrochloric acid to the solution, it was heated to boiling, treated with 5 c. c. of 10 per cent $BaCl_2$, and the total sulfate was determined as $BaSO_4$.

The results obtained with neoarsphenamine are given in Table 1.

TABLE 1.—*Comparison of results for total sulfur and sulfur as sulfate after oxidation by iodine in alkaline solution, in the case of neoarsphenamine*

Manufacturer	Total sulfur [1]	Sulfur as sulfate after oxidation by iodine in alkaline solution	Difference
	Per cent	*Per cent*	*Per cent*
"A"	8.38	8.45	+0.07
"B"	10.32	9.85	−0.47
"C"	10.55	10.69	+0.14
"D"	6.71	6.44	−0.27

[1] These determinations were carried out by Mr. C. G. Remsburg in connection with the routine work of the Hygienic Laboratory, using the methods previously reported (see reference 1).

The results obtained with sulfarsphenamine are given in Table 2.

TABLE 2.—*Comparison of results for total sulfur and sulfur as sulfate after oxidation by iodine in alkaline solution, in the case of sulfarsphenamine*

Manufacturer	Total sulfur	Sulfur as sulfate after oxidation by iodine in alkaline solution	Difference
	Per cent	*Per cent*	*Per cent*
"A"	10.75	4.33	6.42
"B"	12.08	3.86	8.22
"C"	11.38	5.70	5.68
"D"	11.36	4.52	6.84
"E"	12.42	4.25	8.17

The results given in Tables 1 and 2 show that although iodine in alkaline solution oxidized nearly all of the oxidizable sulfur of the neoarsphenamine, so that the results were quite close to those for total sulfur, the corresponding results in the case of the sulfarsphenamine were in most cases less than half of the total sulfur and in one case ("B") even less than one-third of the total sulfur.

[3] The smaller quantity of arsenite was used mostly with neoarsphenamine and the larger when working with sulfarsphenamine.

The probable explanation of this difference in behavior of neoarsphenamine and sulfarsphenamine when oxidized by iodine in alkaline solution is that it is paralleling the similar difference in behavior of sodium formaldehyde sulfoxylate and sodium formaldehyde [4] bisulfite when these are subjected to oxidation by iodine without the addition of alkali. Thus, according to Baumann, Thesmar and Frossard,[5] although iodine will oxidize the sulfur of formaldehyde sulfoxylate to sulfate without the previous addition of bicarbonate, for the oxidation by iodine of the sulfur of formaldehyde bisulfite, the previous addition of bicarbonate is necessary.

The low results for sulfur in the case of sulfarsphenamine appear to be due to a rather sharp differentiation by the iodine in alkaline solution between two different classes of sulfur compounds, the organically combined sulfur and that which remains in the mixture as uncombined [6] sodium formaldehyde bisulfite. That they are not due simply to a slow rate of oxidation of the organically combined sulfur is indicated by the results given in Table 3.

TABLE 3.—*Effect of varying the time on the amount of sulfur oxidized to sulfate by iodine in alkaline solution, in the case of sulfarsphenamine*

Manufacturer	Total sulfur	Time the iodine in alkaline solution was allowed to act	Sulfur by iodine method	Sulfur not oxidized to sulfate by iodine in alkaline solution
	Per cent	*Minutes*	*Per cent*	*Per cent*
"A"	10.40	1	4.89	5.51
Do	10.40	60	4.62	5.78
"B"	12.17	1	3.57	8.60
Do	12.17	60	3.71	8.46
"C"	10.97	1	8.74	2.23
Do	10.97	60	8.63	2.34
"D"	11.61	1	4.31	7.30
Do	11.61	60	4.29	7.32

An inspection of Table 3 shows that there was but little difference in the results obtained when the action of the iodine in alkaline solution was allowed to proceed for only one minute and when the time was prolonged to sixty minutes, which would not have been the case if the organically combined sulfur were continuously oxidized to any considerable extent. It is evident, therefore, that the above-described difference in behavior between neoarsphenamine and sulfarsphenamine can be taken advantage of for the purpose of differentiating

[4] These are the substances that are caused to react with the amino groups of the arsphenamine base to yield neoarsphenamine and sulfarsphenamine, respectively.

[5] See Jellinek: Das Hydrosulfit, pt. II, pp. 100–102, vol. 18, Sammlung chemischer und chemisch-technischer Vorträge (1912).

[6] This appears as the most logical conclusion on the basis of the available facts. There is, however, the possibility that an unknown combination is formed which is unstable and behaves like the uncombined formaldehyde bisulfite. It is in this restricted sense, therefore, that the term "uncombined" is used in this paper. And, of course, we must depend on the values obtained in the iodine titrations to differentiate between the uncombined formaldehyde bisulfite and neoarsphenamine.

between these two substances. And in conjunction with other determinations, such as the determination of the arsenic, total sulfur, amount of sulfate before treatment with iodine, amount of iodine required on direct titration, and amount of iodine required in the presence of alkali, together with the deductions which may be made on the basis of these determinations, it might be possible to evaluate, at least approximately, the composition of mixtures of neoarsphenamine and sulfarsphenamine. The experiments which were carried out with this object in view indicated that this plan is quite feasible.

Before proceeding, however, with this part of the work it may be well to consider the effect of the above-mentioned difference in behavior of iodine in alkaline solution toward the organically combined sulfur of neoarsphenamine and sulfarsphenamine in its relation to the Macallum [7] procedure for examining neoarsphenamine.

In the Macallum procedure it is apparently assumed that there is no difference in behavior toward iodine in alkaline solution between the organically combined methylene bisulfite and that which remains in the mixture as uncombined sodium formaldehyde bisulfite. A close study of the Macallum procedure reveals further that it is apparently assumed that there is no difference in behavior toward iodine in acid solution between the organically combined methylene sulfoxylate and that which remains in the mixture as uncombined sodium formaldehyde sulfoxylate, so that from the figures obtained on titration with iodine in acid solution the total sulfoxylate is calculated; and by adding to these figures 50 per cent, it is assumed that this sum gives the iodine equivalent of the sulfoxylate in alkaline solution. That there is, however, a difference in behavior toward iodine of the organically combined methylene sulfoxylate and that which remains in the mixture as uncombined sodium formaldehyde sulfoxylate has been pointed out by Raiziss and Falkov [8] who conclude that the sulfoxylate which is combined to the amino group of the arsphenamine base is not oxidized by iodine alone. And if the iodine in acid solution reacts only with the inorganic sulfoxylate but not to any considerable extent with the organically combined sulfoxylate, we can readily understand some of the results which Macallum reports. Thus Macallum found by his procedure that a sample of neoarsphenamine which he examined contained 29.12 per cent of methylene bisulfite and only 4.09 per cent of sulfoxylate. This unexpectedly very low result for methylene sulfoxylate and comparatively very high result for methylene bisulfite may be explained as being due to the assumption that the titration with iodine in acid solution is a measure of the total sulfoxylate, including that which is organically combined. If, however, the iodine in acid solution reacts

[7] Jour. Am. Chem. Soc. 44, 2578–2582 (1922).
[8] Jour. Biol. Chem. 46, 209 (1921)

only with the inorganic sulfoxylate but not to any considerable extent with the organically combined sulfoxylate, the figure 4.09 per cent would represent only the sulfoxylate which remained in the mixture as uncombined sodium formaldehyde sulfoxylate; and since the iodine requirement of the methylene bisulfite by the Macallum procedure is obtained by subtracting from the total iodine requirement a figure which includes the iodine requirement of the total sulfoxylate, it follows that by neglecting to subtract the iodine requirement of the organically combined sulfoxylate, we thereby assign to the methylene bisulfite not only the iodine which it itself requires, but also that which was really consumed by the organically combined sulfoxylate, thus making it possible for the results to indicate a much higher methylene bisulfite content than the sample really contains.

In Macallum's paper to which reference has been made there are reported the results obtained with only one sample of neoarsphenamine. It seemed desirable to compare the results obtained by this procedure with several samples of neoarsphenamine and sulfarsphenamine from various manufacturers. The results which were obtained by Macallum's procedure with samples of neoarsphenamine are given in Table 4.

TABLE 4.—*Results by Macallum's procedure with samples of neoarsphenamine*

Manufacturer	Lot No.	Percentage As	0.1 N iodine required by 0.2 g. on direct titration [1]	0.1 N iodine required by 0.2 g. in acid solution by Macallum's procedure	Difference between the total 0.1 N iodine required by 1 g. and the 0.1 N iodine equivalent of the arsphenamine portion in acid solution [2]	Percentage of sulfoxylate by Macallum's procedure [3]	0.1 N iodine required by 0.1 g. in alkaline solution by Macallum's procedure	Difference between the total 0.1 N iodine required by 1 g. and the 0.1 N iodine equivalent of the arsphenamine portion + sulfoxylate [4] in alkaline solution	Percentage of methylene bisulfite by Macallum's procedure [5]
			c. c.	c. c.	c. c.		c. c.	c. c.	
"A"	1	20.33	29.30	27.90	34.40	8.68	31.65	61.20	17.95
"	2	19.86	----------	29.10	42.80	10.81	32.75	64.30	18.85
"	3	20.24	30.50	31.12	50.92	12.85	34.05	61.32	18.00
"	4	20.52	29.96	30.60	46.87	11.83	34.10	65.09	19.09
"B"	1	18.28	28.30	26.90	39.96	10.09	30.10	57.89	16.98
"	2	18.93	33.70	33.35	68.84	17.38	35.30	60.07	17.61
"	3	19.58	34.76	35.75	77.48	19.55	36.00	47.59	13.96
"C"	1	19.40	34.10	32.40	61.66	15.57	35.45	67.60	19.82
"D"	1	19.11	21.50	23.55	18.92	4.77	27.40	54.14	15.88

[1] In order to conserve the material, this titration was carried out on 0.1 g. only, but in the tables the results are reported on the basis of 0.2 g. in order to make the figures directly comparable with those obtained in the titration in acid solution by Macallum's procedure. The sample of the neoarsphenamine or sulfarsphenamine was dissolved in 5 c. c. H_2O, mixed with 20 c. c. 0.1 N iodine and the excess iodine was titrated with 0.1 N $Na_2S_2O_3$ using starch as indicator.

[2] Using Macallum's procedure and his factor for calculating the c. c. of 0.1 N iodine equivalent of the arsphenamine portion, namely, percentage of arsenic multiplied by 5.172 (775.5/149.92).

[3] The c. c. of 0.1 N iodine equivalent of the sulfoxylate (CH_2OSONa) divided by 3.96 (400/101). Thus, for example, the first value of 8.68 is obtained by dividing 34.40 by 3.96.

[4] The percentage of arsenic multiplied by 10.02 (1502/149.9).

[5] Which is 1.5 times that in acid sol.

[6] The c. c. of 0.1 N iodine equivalent of the methylene bisulfite (CH_2OSO_2Na) divided by 3.41 (400/117). Thus, for example, the first value of 17.95 is obtained by dividing 61.20 by 3.41.

The results obtained by Macallum's procedure with samples of sulfarsphenamine are given in Table 5.

TABLE 5.—*Results by Macallum's procedure with samples of sulfarsphenamine*

Manufacturer	Percentage of As	0.1 N iodine required by 0.2 g. on direct titration[1]	0.1 N iodine required by 0.2 g. in acid solution by Macallum's procedure	Difference between the total 0.1 N iodine required by 1 g. and the 0.1 N iodine equivalent of the arsphenamine portion in acid solution[2]	Percentage of sulfoxylate by Macallum's procedure[3]	0.1 N iodine required by 0.1 g. in alkaline solution by Macallum's procedure	Difference between the total 0.1 N iodine required and the 0.1 N iodine equivalent of the arsphenamine portion[4]+sulfoxylate[5] in alkaline solution	Percentage of methylene bisulfite by Macallum's procedure[6]	Percentage of methylene bisulfite on basis of found content of oxidizable sulfur minus the sulfur equivalent of the sulfoxylate	Percentage of total sulfur	Percentage of sulfur as sulfate	Percentage of total oxidizable sulfur
		c. c.	c. c.	c. c.		c. c.	c. c.					
"A"	21.08	21.90	24.95	15.98	4.04	25.20	17.31	5.08	39.23	12.48	0.47	12.01
"B"	19.21	20.86	24.40	22.65	5.72	24.30	16.55	4.85	36.08	12.05	0.37	11.68
"C"	20.29	21.66	22.45	7.78	1.96	23.10	16.93	4.96	36.08	10.76	0.27	10.49
"D"	22.49	23.70	26.15	14.43	3.64	28.40	37.01	10.85	32.17	10.25	0.30	9.95
"E"	18.93	19.98	21.50	9.69	2.42	25.20	47.92	14.05	40.29	12.42	0.63	11.79

[1,2,3 4,5,6] See corresponding footnotes of Table 4.

It is seen from the results given in Table 4 that by the Macallum procedure most of the samples of neoarsphenamine examined showed an unexpectedly greater percentage of methylene bisulfite than sulfoxylate. Similarly, the results given in Table 5 show an unexpectedly very low methylene bisulfite content in samples of sulfarsphenamine. Thus, for example, on the basis of the found content of oxidizable sulfur minus the sulfur equivalent of the sulfoxylate, the sulfarsphenamine from manufacturer "B" should[9] contain 36.08 per cent methylene bisulfite (CH_2OSO_2Na) against only 4.85 per cent found by the Macallum procedure. Likewise, the sample from manufacturer "C" should contain 36.08 per cent methylene bisulfite on the basis of the found content of oxidizable sulfur minus the sulfur equivalent of the sulfoxylate, whereas the Macallum procedure showed the presence of only 4.96 per cent.

The plan of analysis on the basis of which it appears possible to evaluate, at least approximately, the composition of commercial samples of neoarsphenamine and sulfarsphenamine, to which reference was made above, was carried out as follows: In addition to the arsenic determination, the total sulfur and sulfate were determined by the methods previously reported.[10] By means of the procedure described at the beginning of this paper, the total sulfur oxidizable to sulfate by

[9] As shown in Table 5, the total oxidizable sulfur in this case was 11.68 per cent; the percentage of sulfoxylate (CH_2OSONa) by the Macallum procedure was 5.72, which is equivalent to 1.81 per cent (5.72×0.3168) sulfur; 11.68−1.81=9.87; 9.87×3.656=36.08.

[10] See reference 1.

iodine in alkaline solution was determined and also the total amount of iodine required under these conditions was ascertained. The amount of iodine required on direct titration was determined by dissolving 0.1 g. of the sample in 5 c. c. H_2O, mixing with 20 c. c. 0.1 N iodine and titrating the excess iodine with 0.1 N sodium thiosulfate. By subtracting the iodine equivalent[11] of the arsphenamine portion under these conditions, the difference was taken as representing approximately the iodine equivalent of the uncombined formaldehyde sulfoxylate. In the case of sulfarsphenamine, the sulfur oxidized to sulfate by iodine in alkaline solution was taken as an approximate measure of the uncombined sodium formaldehyde bisulfite. By subtracting the uncombined formaldehyde sulfoxylate in the case of neoarsphenamine or the uncombined formaldehyde bisulfite in the case of sulfarsphenamine from the total, as calculated on the basis of the total sulfur and sulfate determinations, the corresponding combined portion was ascertained. If this was more than required to combine with one of the amino groups of the arsphenamine as calculated on the basis of the arsenic determination, the excess was assumed to be present as the di-substitution product. Since in the case of most of the samples of neoarsphenamine examined the results for total sulfur and the corresponding figures obtained by the iodine method described at the beginning of this paper were quite close, being in some instances quite within the possible experimental error, it seemed reasonable to assume, tentatively at least, that where there is a considerable difference between the result for total sulfur and the corresponding figure obtained by the iodine method, this difference probably represents a sulfarsphenamine-like impurity the sulfur of which is not oxidized to sulfate by the iodine method. The results obtained with some commercial samples of neoarsphenamine are given in Table 6.

[11] The same factors as used by Macallum were employed in these calculations. The c. c. of 0.1 N iodine equivalent of the arsphenamine portion in one gram of the sample, under these conditions, was calculated by multiplying the percentage of arsenic by 5.172 (775.5/149.92).

TABLE 6.—*Results with commercial samples of neoarsphenamine*

Manufacturer	Lot No.	Percentage of As	Indicated percentage of total arsenical on basis of As determination [1]	Percentage of total sulfur	Percentage of sulfur by iodine method	Indicated percentage of sulfarsphenamine-like impurity [2]	Percentage of sulfur as sulfate	Indicated percentage of sulfur as uncombined formaldehyde sulfoxylate [3]	Indicated percentage of the mono-substitution product [4]	Indicated percentage of the di-substitution product	Calculated 0.1 N iodine equivalent of the oxidizable sulfur in 0.1 g. on basis of the gravimetric determinations [5]	0.1 N iodine actually found to be required by 0.1 g. in excess of the equivalent of the arsphenamine portion	Approximate measure in terms of 0.1 N iodine of possibly nonsulfur reducing substances in 0.1 g. [6]	Approximate measure in terms of 0.1 N iodine of oxygenated impurities in 0.1 g.
											c. c.	*c. c.*	*c. c.*	*c. c.*
"A"	1	20.33	76.71	7.92	8.08	0	1.01	3.31	86.64	0	13.25	13.03	------	------
Do	2	19.58	73.88	8.38	8.45	0	1.13	2.50	84.69	15.31	13.72	14.58	------	------
Do	3	20.24	76.37	9.27	8.78	2.71	0.89	3.82	97.60	0	14.80	15.82	------	------
Do	4	20.52	77.42	8.84	8.70	0	0.89	3.50	98.40	0	14.64	14.84	------	------
"B"	1	19.40	73.20	10.32	9.85	2.52	1.37	3.87	84.75	15.25	15.90	15.36	------	------
Do	2	19.68	74.23	11.75	11.50	0.46	1.20	5.34	81.06	18.94	19.31	17.78	------	0.53
Do	3	18.93	71.42	10.54	10.07	2.52	1.13	5.65	84.14	0	16.76	18.03	------	------
"C"	1	19.58	73.88	11.05	10.84	0	1.15	5.80	93.06	0	18.17	18.98	------	------
Do	2	19.40	73.20	10.12	9.21	6.63	2.03	5.62	41.16	0	13.46	17.44	2.98	------
Do	3	19.86	74.93	10.55	10.69	0	1.99	4.97	87.97	0	16.31	17.30	------	------
"D"	1	20.24	76.37	6.71	6.44	0.64	0.63	4.34	34.35	0	10.90	15.02	3.12	------

[1] All calculations were based on the formulæ for neoarsphenamine and sulfarsphenamine, respectively, given in the footnote at the beginning of this paper. Since the figures are intended to give only approximate comparisons, no allowance or correction was made on the basis of the actual composition of each sample as indicated by the results of the analyses. Assuming, therefore, a molecular weight of 566 for neoarsphenamine, the factor for converting percentage of arsenic to percentage of neoarsphenamine would be 3.773 (566÷150), which was the factor used.

[2] In making these calculations, a difference between the total sulfur and sulfur by the iodine method of about 0.2 per cent was assumed as possibly representing the experimental error. Hence, where this difference was greater, 0.2 per cent was first subtracted and only the excess over this quantity was assumed to represent the sulfarsphenamine-like impurity. Thus, for example, in the case of sample No. 3 "A," the calculation may be indicated as follows: 9.27−8.78=0.49; 0.49−0.2=0.29; 0.29×9.344=2.71.

[3] These figures are based on the assumption that the excess iodine over the equivalent of the arsphenamine portion required on direct titration is an approximate measure of the uncombined formaldehyde sulfoxylate, as is indicated by the work of Raiziss and Falkov (reference 8). Thus, for example, 0.1 gram of sample No. 1 "A" required 14.65 c. c. 0.1 *N* iodine on direct titration. The calculated 0.1 *N* iodine equivalent of the arsphenamine portion was 10.51 c. c. (20.33×0.5172), leaving 4.14 c. c. as the approximate measure of the uncombined formaldehyde sulfoxylate, which corresponds to 3.31 mg. sulfur (4.14×0.8) in the 0.1 gram sample, or 3.31 per cent. It can not be emphasized too much, however, that all the calculations are based on the assumption that the sample contains no other impurities than those of which account is here taken. The presence of any additional impurity may, of course, affect the results one way or the other but its specific nature would have to be known before we could judge as to just what its effect would be. Thus, for example, if there is reason to suspect the presence of free sulfite or bisulfite, this would have to be taken into consideration in interpreting the results obtained on direct titration with iodine. Similarly, if further work should show that any one of our assumptions is not strictly correct, the results here reported would, of course, need a reinterpretation.

[4] Thus, for example, in the case of sample No. 2 "A," since the percentage of arsenic was 19.58, the theoretical percentage of sulfur for the mono-substitution product would be 4.18 (32÷150=0.2133; 19.58×0.2133=4.18). Subtracting the 1.13 per cent of sulfur originally present as sulfate from the total sulfur by the iodine method (8.45 per cent), we have 7.32 as the percentage of sulfur oxidizable by the iodine. Subtracting from this 2.50, the indicated percentage of sulfur as uncombined formaldehyde sulfoxylate, we have 4.82 for the percentage of sulfur as organically combined sulfoxylate, i. e., 0.64 per cent in excess of that required for the mono-substitution product. This would permit of 15.31 per cent of the arsenical to be present as the di-substitution product. Substracting this figure from 100, we have 84.69 as the indicated percentage of the mono-substitution product. Where the results indicated that the sample in question contained some sulfarsphenamine-like impurity, the corresponding amount of arsenic was subtracted in calculating the theoretical percentage of sulfur required for the neoarsphenamine.

[5] Thus, for example, the first figures in these columns were obtained as follows: The total sulfur found by the iodine method was 8.08 per cent of which 1.01 per cent was present originally as sulfate, thus leaving 7.07 per cent of sulfur oxidizable by the iodine. In other words, 0.1 g. of the sample contained 7.07 mg. of sulfur oxidizable by the iodine. When the sulfur of formaldehyde sulfoxylate is oxidized to sulfate by iodine in alkaline solution, the formaldehyde residue is simultaneously oxidized to formate and hence each molecule takes up three atoms of oxygen which are, of course, equivalent to six atoms of the iodine; from which follows that 1 c. c. of 0.1 *N* iodine is, under these conditions, equivalent to 0.5333 mg. (3.2 ÷ 6) of sulfur. Dividing 7.07 by 0.5333, we obtain 13.25. Now the total 0.1 *N* iodine actually found to be required in this case was 33.40 c. c. Subtracting 20.37 c. c. (percentage of As, 20.33 × 1.002) as the arsphenamine equivalent, we obtain 13.03 c. c. as the amount of the 0.1 *N* iodine which was used up in oxidizing the formaldehyde sulfoxylate residue.

[6] A difference of about 1 c. c. of 0.1 *N* iodine probably is a fair allowance for the accumulated experimental errors. Hence where the difference was greater than 1 c. c. 0.1 *N* iodine, the latter quantity was subtracted, and only the excess over this quantity was assumed to represent nonsulfur reducing substances, etc.

The results given in Table 6 show that the figures for total sulfur and the corresponding figures by the iodine method were quite close in most of the cases studied, thus indicating that there were but little sulfarsphenamine-like impurities in most of these preparations. These results also indicate that with the exception of only a few samples there was not enough organically combined sulfur to account for a di-substitution product; and that in two of the samples there was not sufficient organically combined sulfur to account for even 50 per cent of the mono-substitution product.

The results obtained with commercial samples of sulfarsphenamine are given in Table 7.

TABLE 7.—*Results with commercial samples of sulfarsphenamine*

Manufacturer	Lot No.	Percentage of As	Indicated percentage of total arsenical on basis of As determination [1]	0.1 N iodine required by 0.1 g. on direct titration	Calculated 0.1 N. iodine equivalent of the arsphenamine portion in 0.1 g. on direct titration [2]	Percentage of total sulfur	Percentage of sulfur by iodine method [3]	Percentage of sulfur as sulfate	Indicated percentage of sulfur as uncombined formaldehyde bisulfite [4]	Indicated percentage of the monosubstitution product [5]	Indicated percentage of the di-substitution product	Calculated 0.1 N iodine equivalent of the oxidizable sulfur in 0.1 g. on basis of the gravimetric [6] determinations	0.1 N iodine actually found to be required by 0.1 g., in excess of the arsphenamine equivalent	Approximate measure [7] in terms of 0.1 N iodine of nonsulfur reducing substances or oxidizable sulfur other than that corresponding to sulfite (SO_3) in 0.1 g.
				c. c.	c. c.							c. c.	c. c.	c. c.
"A"	1	20.20	80.54	10.83	10.45	10.76	3.96	0.27	3.69	42.23	57.77	4.61	6.16	0.55
Do	2	19.49	77.71	10.20	10.08	10.75	4.33	0.87	3.46	45.68	54.32	4.32	5.57	0.25
Do	3	19.02	75.83	10.65	9.84	10.40	4.89	0.71	4.18	64.29	35.71	5.22	6.84	0.62
"B"	1	19.58	78.07	10.65	10.13	12.53	3.70	0.46	3.24	0	100	4.05	4.58	----
Do	2	19.40	77.35	10.25	10.03	12.17	3.57	0.29	3.28	0	100	4.10	4.06	----
Do	3	19.21	76.59	10.43	9.94	12.05	3.86	0.37	3.49	0	100	4.36	6.65	1.29
Do	4	18.83	75.08	10.45	9.74	12.08	3.86	0.10	3.76	0	100	4.70	5.13	----
"C"	1	21.08	84.05	11.35	10.90	10.97	8.74	2.33	6.41	49.55	0	8.01	7.58	----
Do	2	22.30	88.91	11.83	11.53	10.55	8.72	2.21	6.51	38.45	0	8.14	7.36	----
Do	3	22.58	90.03	12.05	11.68	10.29	9.33	2.85	6.48	19.91	0	8.10	7.03	----
"D"	1	21.32	85.00	11.25	11.03	11.61	4.31	0.43	3.88	39.56	60.44	4.85	4.58	----
Do	2	22.77	90.78	11.95	11.78	10.62	5.41	0.34	5.07	92.80	7.20	6.33	6.38	----
Do	3	21.65	86.32	11.25	11.20	11.38	5.70	0.52	5.18	77.00	23.00	6.48	8.01	0.53
"E"	1	20.90	83.33	10.90	10.81	11.36	4.52	0.28	4.24	46.64	53.36	5.30	7.36	1.06
"F"	1	18.93	75.47	10.30	9.80	12.42	4.25	0.63	3.62	0	100	4.53	5.87	0.34

[1] These figures were obtained by multiplying the percentage of arsenic by 3.987 (598÷150).

[2] These figures were obtained by multiplying the percentage of arsenic by 0.5172 (see footnote 11).

[3] Sample No. 3 of manufacturer "A," No. 2 of "B," No. 1 of "C," and No. 1 of "D" were allowed to react with the iodine in alkaline solution for only one minute.

[4] For example, the figure 3.69 is obtained by subtracting the 0.27 per cent of sulfur as sulfate from the 3.96 per cent of total sulfur by the iodine method.

[5] For example, in the case of No. 1 "A," the first figures in these columns were derived as follows: Subtracting the 3.96 per cent of sulfur by the iodine method from the total sulfur of 10.76 leaves 6.80 per cent of sulfur as sulfarsphenamine. Since the percentage of arsenic was 20.2, the mono-substitution product would require 4.31 per cent (20.2×0.2133) of sulfur, thus leaving 2.49 per cent of sulfur available for the di-substitution product, which would correspond to 57.77 per cent of the latter. Subtracting this figure from 100, leaves 42.23 as the indicated percentage of the mono-substitution product. Since these calculations are dependent on several separate determinations (arsenic, total sulfur, and sulfur by the iodine method), each of which has its experimental error, we must regard these figures as only approximate and we need not be surprised if in some instances the indicated organically combined sulfur apparently exceeds a little that which would correspond to the di-substitution product. On the other hand, this apparently small excess of organically combined sulfur may have some significance and should be examined more closely when more exact methods become available.

[6] The method of calculation was similar to that employed in the case of neoarsphenamine (see footnote 5 of Table 6); but since one molecule of formaldehyde bisulfite when oxidized by iodine in alkaline solution takes up only two atoms of oxygen and hence is equivalent to only four atoms of iodine, 1 c. c. of the 0.1 N iodine solution is equivalent to 0.8 mg. (3.2÷4) of sulfur. Thus, for example, the figure 4.61 is obtained by dividing 3.69 (3.96—0.27) by 0.8.

[7] See footnote 6 of Table 6.

The results given in Table 7 indicate that the sulfarsphenamine of some manufacturers ("B" and "F") contains sufficient organically combined sulfur to account for a 100 per cent di-substitution product. On the other hand, two of the samples examined apparently did not contain sufficient organically combined sulfur to account for even about 50 per cent of the mono-substitution product.

When we remember that the figures representing the calculated 0.1 N iodine equivalent of the oxidizable sulfur given in Tables 6 and 7 are based on the results of several separate determinations (arsenic, sulfur as sulfate, and sulfur by the iodine method), each of which has its experimental error, and are also dependent on the empirical factor used for calculating the iodine equivalent of the arsphenamine portion, it seems reasonable to conclude that the several comparatively close agreements between the calculated and found values indicate a fair check on the assumptions on which the calculations are based. Likewise, the number of comparatively close agreements, in Table 7, between the amount of 0.1 N iodine found to require on direct titration and the corresponding calculated equivalent of the arsphenamine portion may be taken as a fair check on the empirical factor used in calculating the iodine equivalent of the arsphenamine portion.

In order to obtain direct evidence bearing on the correctness of the assumption that, where there is a considerable difference between the result for total sulfur and the corresponding figure obtained by the iodine method, this difference probably represents an approximate measure of the quantity of a sulfarsphenamine-like impurity, the following experiment was carried out:

Two mixtures of neoarsphenamine and sulfarsphenamine, designated as No. 1 and No. 2, respectively, were prepared by mixing equal weights of commercial samples of neoarsphenamine and sulfarsphenamine. Neoarsphenamine No. 4 of manufacturer "A" (Table 6) and sulfarsphenamine No. 2 of manufacturer "B" (Table 7) were used for preparing mixture No. 1, and neoarsphenamine No. 2 of manufacturer "B" and sulfarsphenamine No. 2 of this same manufacturer were used for preparing mixture No. 2. The iodine method described in this paper was then applied to 0.1 g. of each of these mixtures. This method showed 6.20 per cent sulfur in mixture No. 1 and 7.46 per cent sulfur in mixture No. 2. The total sulfur of mixture No. 1 was 10.51 per cent and that of mixture No. 2, 11.96 per cent. If we assume that the difference between the total sulfur and that obtained by the iodine method represents the approximate quantity of the sulfarsphenamine, the above results would indicate 40.27 per cent of sulfarsphenamine in mixture No. 1 and 42.05 per cent in mixture No. 2. The corre-

sponding calculated [12] percentages, based on the results of the separate analyses of the constituents of these mixtures, are 39.33 and 39.85, respectively.

Inasmuch as this paper includes a number of features, some of which could be utilized independently, it might be well to discuss briefly several of them.

In the first place, it is to be noted that the procedure described at the beginning of this paper, which has been referred to as the iodine method, is a new method for determining the sulfur of neoarsphenamine. This method is even simpler and requires less time than the writer's previously reported [13] method, and certainly is much more convenient for routine work than either the Carius or sodium peroxide fusion methods. In addition to these advantages, it apparently has the further very important advantage that it is a very selective method for the sulfur of neoarsphenamine and can be used for the determination of the sulfur of this compound even in the presence of such a closely related sulfur-containing compound as sulfarsphenamine. This method, therefore, enables us also to estimate the sulfarsphenamine in a mixture of neoarsphenamine and sulfarsphenamine. All we need do in order to accomplish this latter purpose is to determine also the total sulfur. The difference between the total sulfur and the sulfur by the iodine method apparently is a measure of the sulfarsphenamine-like impurity in neoarsphenamine.

When this work was first undertaken, some preliminary experiments were carried out with the object of utilizing indigo disulfonate [14] for the purpose of estimating neoarsphenamine in mixtures of this substance with sulfarsphenamine. It was soon realized, however, that inasmuch as under present conditions assuredly pure preparations, which might serve as standards, are not available, it would be desirable to be able so to conduct this investigation that we could obtain confirmatory evidence which is not dependent on the substances used being assuredly pure. It occurred to the writer that this might be accomplished by taking advantage of the reasonable expectation that when neoarsphenamine or sulfarsphenamine is

[12] It may be helpful to indicate the steps in these calculations. In the case of mixture No. 1, the sulfarsphenamine which was added showed an arsenic content of 19.40 per cent, which would correspond to 77.35 per cent sulfarsphenamine (19.4 × 3.987). If we do not allow for any experimental errors in the figures for total sulfur and sulfur by the iodine method in the case of the neoarsphenamine of this mixture, these figures would indicate a sulfarsphenamine-like impurity of 1.31 per cent (8.84−8.70=0.14; 0.14×9.344=1.31). This mixture (equal weights of the neoarsphenamine and sulfarsphenamine) should contain a percentage of sulfarsphenamine just half of the sum of the corresponding percentages in the constituents of this mixture, i. e., 39.33 (77.35+1.31=78.66; 78.66÷2=39.33). Similarly, in the case of mixture No. 2 the results of the analysis of the neoarsphenamine used in this case would indicate a sulfarsphenamine-like impurity of 2.34 per cent (11.75−11.50=0.25; 0.25×9.344=2.34). This mixture, therefore, should show a percentage of sulfarsphenamine of 39.85 (77.35+2.34=79.69; 79.69÷2=39.85). In the case of mixture No. 1, the difference between the percentage of total sulfur and sulfur by the iodine method was 4.31, which would indicate a sulfarsphenamine content of 40.27 (4.31×9.344). In the case of mixture No. 2, the corresponding difference was 4.50, which would indicate a sulfarsphenamine content of 42.05.

[13] See reference 1.

[14] Pub. Health Rep., 37, 2783-2798 (1922).

oxidized part or all of the sulfur would be oxidized to sulfate and that, therefore, by determining the amount of increased sulfate at the end of the oxidation process, we could have some check on our assumptions as to the function played by the oxidizing agent. This aim at once ruled out the use of such oxidizing agents as indigo disulfonate, methylene blue, etc., which contain sulfur themselves. It seemed that the use of elementary iodine would be the ideal reagent for this purpose. The titration with iodine has the further advantage that it can be carried out without special arrangements for the exclusion of air. It required, however, considerable experimentation in order to be able to utilize iodine for this purpose and at the same time retain the following three other advantages: (1) Of utilizing an almost instantaneous reaction, thus saving time; (2) of having the reaction proceed at room-temperature, thus avoiding possibly interfering decompositions; and (3) of using a reagent for freeing the solution from the excess iodine which does not appreciably interfere with the subsequent quantitative precipitation of the sulfate as barium sulfate. The procedure given in this paper appears to have all of these advantages.

The advantage of using such a checking system in this case appears to be well demonstrated by the fact that it helped to bring about the discovery of the possible errors of interpretation of the results obtained by the Macallum procedure. Inasmuch as the latter procedure is one of the chief methods given in the literature for examining neoarsphenamine, a true interpretation of the results obtained by this method seems to be of importance.

Another feature of this paper is a simple method for estimating the amount of uncombined formaldehyde bisulfite which may be present in a sample of sulfarsphenamine. This method depends on the observation that, by the iodine method described in this paper, apparently only the sulfur of the uncombined formaldehyde bisulfite is oxidized to sulfate but not the organically combined methylene bisulfite.

Regardless of the other interpretations which might be given to the results reported in this paper, the fact that one can subject samples of commercial neoarsphenamine or sulfarsphenamine to an identical chemical treatment and show that they behave differently, appears of importance. It may be that these chemical differences do not correspond to any considerable differences in biological properties, but the plan of analysis outlined in this paper should enable us to determine this point experimentally.

When using the plan of analysis outlined in this paper and obtaining results which indicate that the sample in question contains only sufficient organically combined sulfur to correspond to the mono-

substitution product, there can be no criticism that we are making any arbitrary assumptions when we conclude that such a preparation is very far from being a 100 per cent di-substitution product; and similarly, when the results indicate that the sample in question does not contain sufficient organically combined sulfur to correspond to even 50 per cent of the mono-substitution product, we are not making any arbitrary assumptions when we conclude that such a preparation is far from being even a 100 per cent mono-substitution product. On the other hand, we can not emphasize too much that when we assume that the mono-substitution product is first formed, and it is only the organically combined sulfur in excess of that required to form the mono-substitution product that is present as the di-substitution product, this assumption is strictly arbitrary and may not be correct; but it appears advantageous for the present to make such an assumption, as it enables us to make rather rough comparisons between preparations of grossly different composition.

Finally, it may be pointed out that the plan of analysis outlined in this paper is not intended to enable one to detect fraudulent adulterations, since it is probably quite possible to introduce impurities intentionally which will interfere with the proper working of the methods given in this paper. It is rather the aim to enable the honest manufacturer to control the uniformity and composition of his own products by providing a plan of analysis which is comparatively simple of execution and suitable for routine work. As compared with the scheme of Raiziss and Falkov [15] for the examination of neoarsphenamine, it has the advantage of providing a simpler method [16] for determining the total sulfur instead of the Carius method and a simpler method [17] for determining the sulfur present originally as sulfate, besides making the plan of analysis include sulfarsphenamine and uncombined formaldehyde bisulfite.

SUMMARY

It was found that although iodine in alkaline solution readily oxidizes nearly all of the sulfur of neoarsphenamine to sulfate, it apparently does not act the same way on the organically combined sulfur of sulfarsphenamine. Advantage is taken of this difference in behavior between neoarsphenamine and sulfarsphenamine for the purpose of differentiating between these two substances. Such treatment with iodine in alkaline solution apparently differentiates also between the organically combined methylene bisulfite and that which remains in the sulfarsphenamine as uncombined sodium formaldehyde bisulfite. And in conjunction with other determinations, such as

[15] Jour. Biol. Chem., 46, 209 (1921).
[16] Pub. Health Rep., 39, 750-754 (1924).
[17] Jour. Ind. Eng. Chem., 14, 624 (1922).

the determination of arsenic, total sulfur, amount of sulfate before treatment with iodine, amount of iodine required on direct titration, and amount of iodine required in the presence of alkali, together with the deductions which may be made on the basis of these determinations, it appears possible to evaluate, at least approximately, the composition of commercial samples of neoarsphenamine and sulfarsphenamine. The results obtained by using such a plan of analysis indicate that most of the samples of neoarsphenamine examined contained but little sulfarsphenamine-like impurities. On the other hand, these results indicate that most of these samples did not contain enough organically combined sulfur to account for a di-substitution product; and that in two of the preparations examined, there was not found sufficient organically combined sulfur to account for even 50 per cent of the mono-substitution product. In the case of the samples of sulfarsphenamine examined, the results indicate that while some manufacturers turn out a product which contains sufficient organically combined sulfur to account for a 100 per cent di-substitution product there were two samples encountered which apparently did not contain sufficient organically combined sulfur to account for even about 50 per cent of the mono-substitution product.

CANYON AUTOMOBILE CAMP, YELLOWSTONE NATIONAL PARK

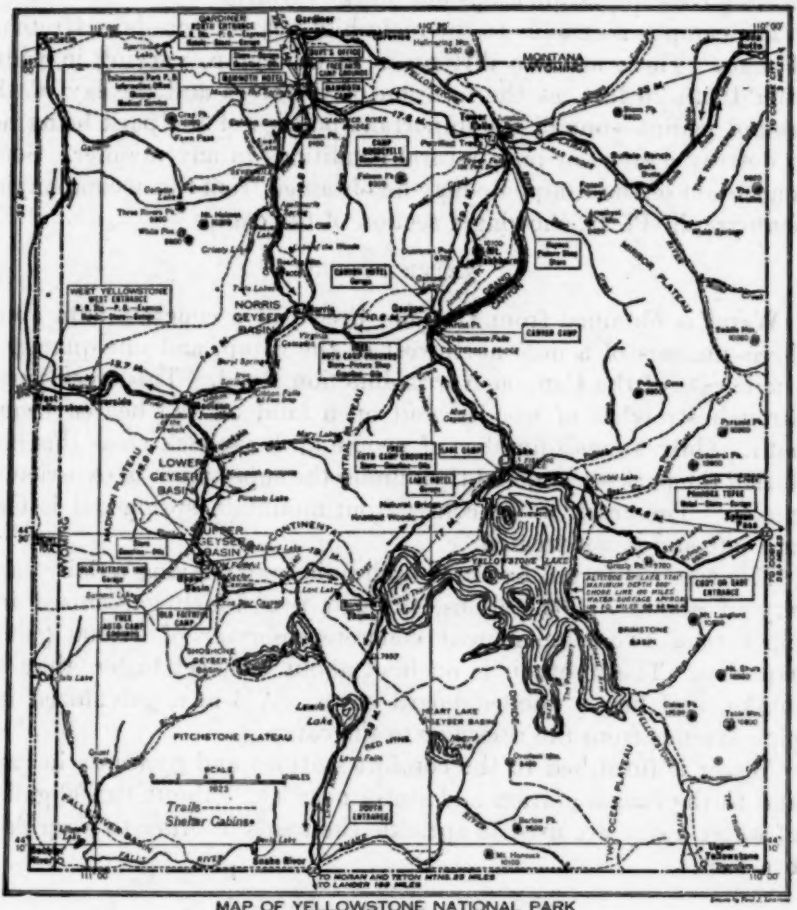
By Isador W. Mendelsohn, Associate Sanitary Engineer, United States Public Health Service

The progress of the automobile industry and its influence upon public health—as a factor in the spread of communicable diseases—constitute new problems of increasing magnitude which are now receiving the attention of health officials. Persons who a few years ago remained at home now travel by automobile to Florida, Maine, California, and other States for pleasure and for business. A reliable indicator of such travel is the number of visitors at the national parks, especially Yellowstone. In 1924 there were 144,158 visitors in Yellowstone National Park, of whom 100,186 came in 30,689 automobiles. In 1923 there were 138,352 visitors, of whom 91,224 came in 27,359 cars. These visitors represented every State, as well as Alaska, the Philippines, Hawaii, the Canal Zone, and 23 foreign countries. An estimate places the number of motorists camping out in public grounds in the park at 85,000. When one considers that the park season is limited to the period between June 20 and September 20, these figures show the large congregation of people in a short period.

Realizing the attendant public health problems introduced by the mingling, in these parks, of so many people from all parts of the country and even the world, the National Park Service obtained the

cooperation of the United States Public Health Service in looking after the sanitation of the parks and assisting with medical service. Sanitary Engineer H. B. Hommon, of the Public Health Service, was placed in charge of such work in 1921, with headquarters at San Francisco, Calif., and with two sanitary engineers as assistants.

A part of the policy of Superintendent Albright, of Yellowstone National Park, is the establishment of public automobile camps at various scenic and central points in the park. These camps are to be provided with all necessary sanitary conveniences for the comfort and health of the automobile campers. Experience has shown the advisability of having many small camps, large camps with 800 or more people being unsuited to conditions in Yellowstone. In accordance with this policy, automobile camps have already been established at the principal points of interest, such as Mammoth Hot Springs, Old Faithful Geyser, Yellowstone Lake, and the Canyon of the Yel-



MAP OF YELLOWSTONE NATIONAL PARK

Ranger Denotes Ranger Station ←—→ Direction of Travel

Distances given are between main points by road

lowstone. The Canyon automobile camp is the newest, having been begun in the 1923 season and completed in the 1924 season.

SITE OF THE CANYON AUTOMOBILE CAMP

The Canyon camp covers a plot of ground about 30 acres in extent, along the main road from Yellowstone Lake to Tower Falls, near the point where a branch road turns off to Norris Junction, as shown on the map.

The ground is level for but a small area, the remainder having a slope, pronounced in parts. The drainage is good, the run-off being toward several creeks. Most of the area used at the present time is wooded, with the trees sufficiently separated to furnish a suitable camping site for an automobile party. The lay of the camp is in a northerly and southerly direction, with plenty of sunshine, shade, and breeze. The top soil is a sand and clay, with some rocks. In places a rock formation crops out on the surface.

The camp is accessible to the main highway by two short stretches of road. There are two dirt roads in the camp, varying in width from 10 to 20 feet, as the location of the trees and the lay of the ground permit—one of the important policies of the park being not to destroy a tree nor mar natural conditions in any manner. Some conception of the camp site may be obtained from the accompanying photograph (Pl. I), showing a section of the camp.

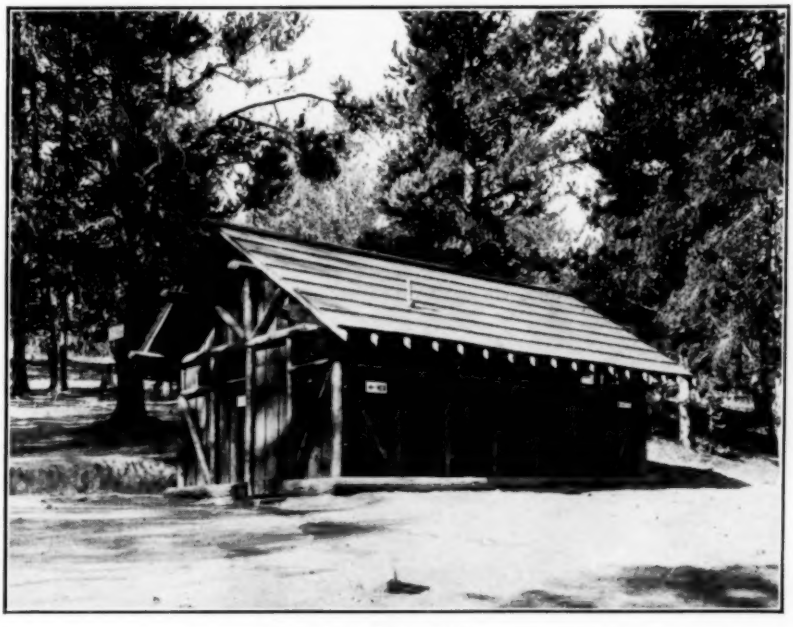
WATER SUPPLY

Water is obtained from Cascade Creek, at a concrete dam about three-quarters of a mile northwest of the camp, and one-quarter of a mile east of the Canyon-Norris Junction Road. This creek passes through stretches of wooded and open land off the beaten tourist path. Only a small number of people on horseback cross this land during the park season, and then under the supervision of experienced guides. The creek water comes from mountain springs; it is clear and soft and is not treated.

The water is forced by three hydraulic rams, having a daily capacity of about 70,000 gallons, through two 3-inch galvanized iron pipes to a two-compartment concrete reservoir of 27,000 gallons capacity. The reservoir is on land about 160 feet higher than the intake, and has a wooden board cover. A 4-inch galvanized iron pipe extends from the reservoir to the camp.

Water is furnished to the comfort stations and hydrants in camp and to the ranger station and stores near by. About 10,000 gallons of water a day are used to sprinkle the roads in order to keep down the dust.

A section of the camp



A comfort station

One of the wooden tables with benches

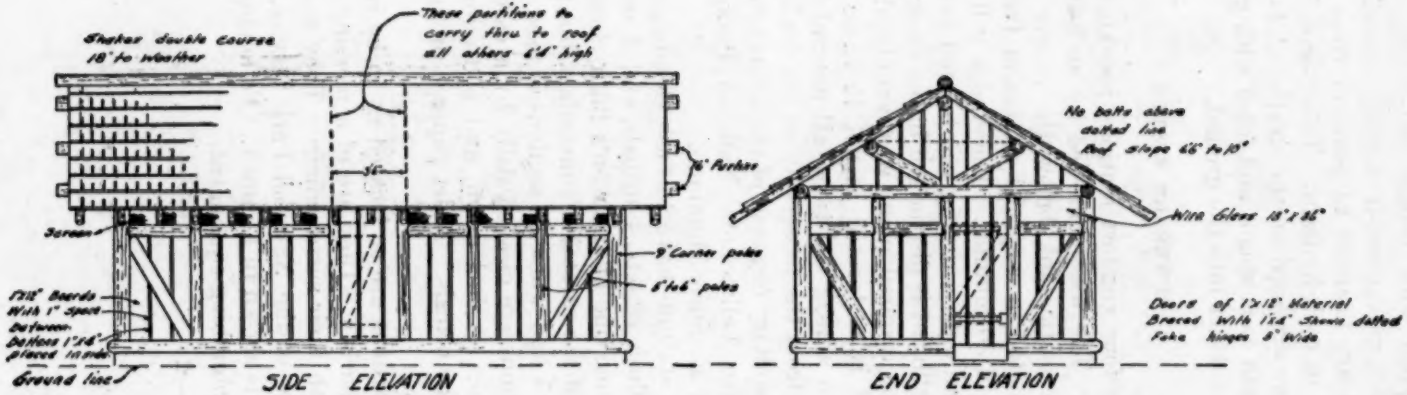
There are 38 water hydrants in the camp, spaced about 200 feet apart and equipped with bronze self-closing cocks. The water lines are of ¾-inch galvanized-iron pipe, extending 36 inches above the ground, and are fastened to posts or trees by galvanized-iron pipe straps, one to each hydrant. Two 2-inch No. 10 flat headed, brass, wood-screws are used on the straps. A hole has been dug in the ground beneath each spigot and filled with gravel to permit the filtration of waste water into the ground.

SEWERAGE SYSTEM

The camp has four comfort stations provided with flush toilets and washbasins. The wastes are led by an 8-inch tile sewer to a covered concrete septic tank below the ranger station, where the effluent is chlorinated in a special section of the tank designed for a contact period of 30 minutes. The sludge will be removed at the end of each season onto a drying bed located adjacent to the tank. The chlorinated effluent is discharged into a creek leading to Yellowstone River. The disposal plant was completed at the end of the 1924 season, and is so located as not to cause a nuisance. It is practically hidden among the trees, all natural facilities being utilized to screen it from the passers-by on the road. The plant will be operated by the sanitary engineer of the United States Public Health Service detailed to Yellowstone National Park, under the supervision of Sanitary Engineer Hommon.

The 4 comfort stations have 16 flush closets and 4 washbasins for women, and 15 flush closets, 4 urinals, and 4 washbasins for men. At the present time one of the men's flush closet compartments is used for storage of the caretaker's materials, but generally the space between the men's and women's sections is used as a storage place. The comfort stations are cleaned daily by a caretaker, paper being removed, the floors washed down, and a deodorant placed in the flush bowls and the urinals. Toilet paper is provided in these buildings, but no soap.

The comfort stations are so located as to be readily available to the automobile tourists. They are of a pleasing rustic design, harmonizing well with their surroundings. They were designed by the landscape engineer of the National Park Service. A layout of one of these stations is shown in Figure 1. Following is a complete list of materials and plumbing equipment.


Shaker double course
18" to weather
These partitions to
carry thru to roof
all others 6'4" high
16" Rafter
Screen
9" Corner poles
6"x6" poles
7/8" Boards
With 1" space
between
Battens 1"x4"
placed inside
Ground line
SIDE ELEVATION
No bolts above
dotted line
Roof slope 45° to 60°
Wire Glass 18"x26"
Doors of 1"x12" Material
Braced with 1"x4" Shown dotted
Pair hinges 8" Wide
END ELEVATION

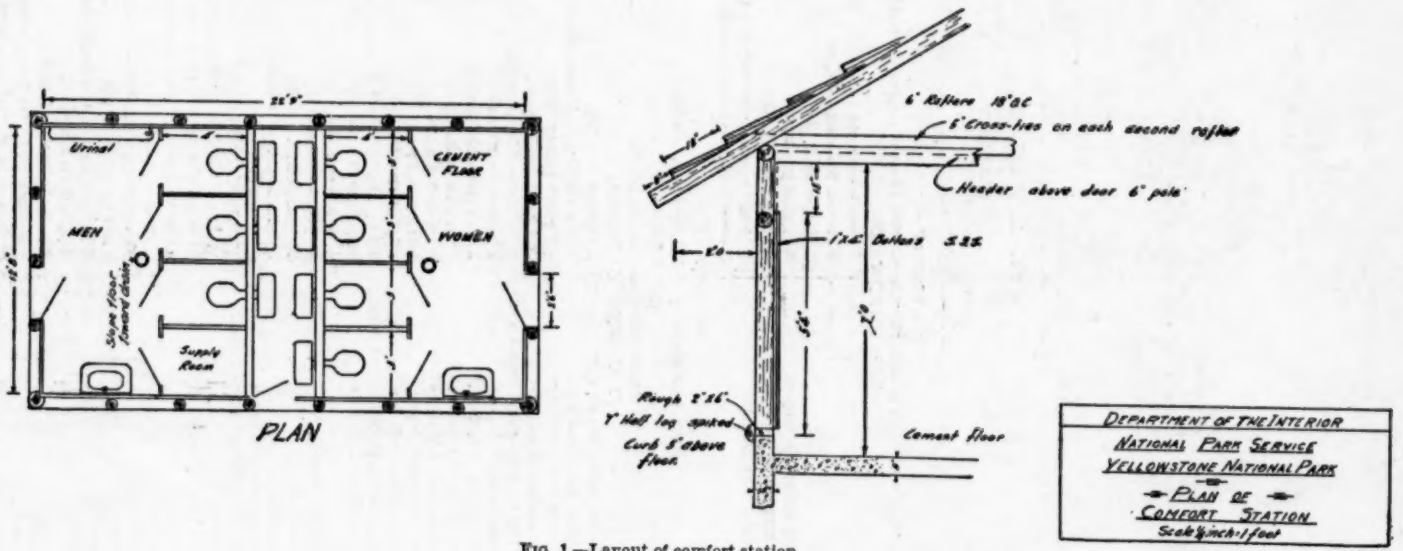


FIG. 1.—Layout of comfort station

List of material for one comfort station

LOG LIST

Number	Size	Length	Linear feet	Use	Number	Size	Length	Linear feet	Use
	Inches	*Ft. In.*				*Inches*	*Ft. In.*		
18	6	7 0	126	Sides.	2	6	4 0	8	Ridgepole support.
18	6	2 11	54	Cross braces.	4	9	7 0	28	Corner logs.
34	5-6	11 6	391	Rafters.	2	7	23 9	48	Half logs.
5	6	28 0	143	Purlins.	2	7	13 8	28	Do.
2	6	12 10	26	Headers.	8	5	14 0	112	Cross braces.
12	6	5 0	60	Corbel braces.					

LUMBER

Pieces	Size	Description	F. B. M.	Pieces	Size	Description	F. B. M.
23	2" x 4" x 12'	C. R	184	3	1" x 6" x 12'	S. 1S	18
96	1" x 12" x 16'	S. 1S	1,536		1" x 8"	Shiplap	900
50	1" x 4" x 12'	S. 1S. 2E	200	8	2" x 6" x 10'	C. R	80
13	2" x 4" x 12'	S. 4S	104				

CEMENT

35 sacks of cement, 1-5 bank run gravel, with 1 sack of cement for floating

HARDWARE

2 rim locks.
3 padlocks.
3 hasps and staples.
8 pairs spring hinges, adjustable tension.
3 pairs 6-inch strap hinges.
2 pairs fake hinges, ¼ by 2 by 27 inches.
2 boxes No. 7 screws.
25 pounds nails, 6d.
10 pounds finishing nails, 6d.
10 pounds nails, 10d.
10 pounds spikes, 60d.
25 pounds spikes, 100d.
30 ⅜ by 13-inch round iron drift pins.
25 pounds 5d. galvanized nails for shakes.

MILLWORK

8 doors, 4-panel—24 by 60 inches—1-inch material

SHAKES

57 bundles (30 shakes to each bundle)

PLUMBING MATERIAL

40 feet 4-inch d. h. extra heavy soil pipe.
20 feet 2-inch d. h. extra heavy soil pipe.
20 feet 4-inch s. h. extra heavy soil pipe.
10 feet 2-inch s. h. extra heavy soil pipe.
2 4-inch c. i. floor drains, with spigot ends, to calk into extra heavy soil pipe.
4 4-inch extra heavy double Y branches.
4 4-inch extra heavy single Y branches.
1 4-inch by 2-inch extra heavy Y branch.
3 4-inch extra heavy one-eighth bends.
6 4-inch extra heavy one-sixteenth bends.
3 4-inch extra heavy one-fourth bends with 2-inch high heel inlet, extra heavy.
1 4-inch clean out.
1 4 by 4 inch extra heavy offset.
1 4-inch roof-flashing lead.
1 2-inch roof-flashing lead.
10 2-inch extra heavy one-eighth bends.
1 4-inch extra heavy 4 by 1¼ inch tapped cross.
8 4-inch calking ferrules.
9 feet 4-inch 6-pound lead soil pipe.
20 pounds wiping solder.
170 pounds calking lead.
25 pounds oakum (rope).
8 brass closet flanges.
8 asbestos graphited rings.
16 closet-floor bolts.
16 closet screws.
16 N. P. oval washers.
16 N. P. round washers.
2 pounds tinner's solder.
30 feet 1½-inch galvanized iron pipe.
2 1½-inch galvanized iron elbows.
2 1½ by 1½ by 1¼ inch G. I. tees.
1 1½-inch G. I. tee.
1 2 by 1½ inch G. I. reducing coupling.
3 1½-inch ring hangers.
24 1 by 12 wood screws.
10 ⅜-inch compression stops.
2 ⅜-inch basin cocks.
2 N. P. cock-hole covers.
2 1¼-inch basin plugs.
1 1¼-inch slip nut.
1 1½-inch slip nut.
2 ½-inch hose bibbs.
2 2 by 2 by ½ inch G. I. tees.
14 ½-inch G. I. elbows.
4 ½-inch G. I. tees.
4 ½-inch G. I. plugs.
20 ½-inch G. I. nipples.
6 ½-inch G. I. 45° elbows.
3 ½-inch gate valves.
1 1½-inch gate valve.
24 1-foot 10-inch r. h. wood screws.
8 reverse-trap siphon-action closet bowls.
8 standard white enamel concealed low-down closet tanks.
8 closet seats, whale-bonite, open front.
8 feet ⅜-inch G. I. pipe.
2 ¾ by ⅜ inch G. I. reducing couplings.
4 ⅜-inch G. I. nipples.
8 ⅜ by ⅜ inch G. I. elbows.
1 1½-inch N. P. "O" trap, with c. o. screw.
2 1¼-inch N. P. "O" trap, with c. o. screw.
1 60-inch white enamel urinal, rolled rim, with brass wash-down pipe and beehive strainer.
2 white enamel 20 by 16 inch washbasins.

Although the drawing shows but seven flush closets, and one locker for storage, the list of equipment is for eight flush closets. The comfort stations were installed at a cost of about $900 apiece. This price was made somewhat high by the high freight charges on materials to the park, and also by the drayage in the park to the camp. A comfort station of this type could be installed at considerably less cost near cities, where the materials are readily available and the freight rates and hauling charges are reasonable.

GARBAGE AND REFUSE DISPOSAL

For the disposal of garbage and refuse from the campers, small, shallow pits were dug throughout the camp at sufficiently frequent intervals to be convenient to the tourists. These pits are cleaned out daily by the camp cleaner, who hauls the garbage and refuse in a horse-drawn cart to a plot of ground about 1 mile from the camp. At this place the wastes are dumped into a pit and covered with earth. Ashes from campfires are collected and disposed of in the same manner.

MOSQUITO-CONTROL MEASURES

Owing to heavy snows and depressions in the ground about the camp, the mosquito infestation was heavy. The mosquitoes prevailing, however, were not of the malaria-carrier type. At the beginning of the 1924 season, oiling was resorted to, because of the short time available and the lack of funds and personnel. Crankcase oil was sprayed over the pools at weekly intervals on three occasions. The work was concentrated on an area within a quarter of a mile of the camp. Toward the end of the season, when funds were available, the depressions were drained. In the future, pools will be drained wherever possible at the beginning of each season, or oiled, until the land within a half mile of the camp is free from mosquitoes. As additional funds become available, farm drain tile will be used as a means of removing breeding places for mosquitoes.

RECREATION, STORE, AND OTHER FACILITIES

On the main road about 200 feet from the camp is a log ranger station and community house combined in one building. The community house side of the building is large and commodious and is furnished with a fireplace, toilets, and wash rooms. Mail for campers may be left at the ranger station, but a mail box is provided in the camp. There is a daily mail service throughout the park season. General information regarding the park is furnished at the station.

Within a few hundred yards of the ranger station are a general merchandise and grocery store, a photograph supply store, a gasoline filling station, and an automobile supply store. A small fruit and grocery store is located at one corner of the camp.

Good fishing streams are within one-quarter of a mile of the camp. The Grand Canyon of the Yellowstone River is within the same distance. The Canyon Hotel and the Canyon Permanent Camp are about one-half mile from the automobile camp. These provide additional entertainment and comforts. Horses are available at these places for interesting scenic rides in the vicinity.

For the convenience of the campers, 30 wooden tables and benches are provided. The tables are 9 feet long by 30 inches wide by 30 inches high, with benches 10 inches wide on each side, fastened to the table. The bill of material for a table with benches is as follows:

45 linear feet 2 by 10 inch planks, surfaced one side.
24 linear feet 2 by 6 inch planks, surfaced one side.
12 linear feet 4-inch log.
6 6-inch logs 6 feet long.
3 pounds 16-penny nails.
1 pint boiled linseed oil for table coating.

Logs 6 inches in diameter set 3 feet in the ground are used for table legs. The 4-inch logs are fastened to the end logs under the ground to prevent the uprooting of the tables by the campers. This type of table is illustrated in the accompanying photograph.

Wood for camp fires is supplied by the Government from fallen trees or from waste boxes from the hotel and the permanent camp. It is cut to convenient lengths and placed in several piles about the camp.

Everywhere throughout the camp signs have been placed to bring important facilities and regulations to the attention of the tourist. These are of wood or metal, painted white, with green letters, and are attached to trees or posts. The signs read as follows: "Dump Refuse Here;" "Water;" "Clean Your Camp;" "Carefully Extinguish Your Camp Fire." At the reservoir is the following sign:

DRINKING WATER
HELP KEEP IT
PURE
FOR OTHERS

There are other signs, such as those directing to toilets and those giving directions to various places in the park. Also the most important regulations are posted.

POLICING OF THE CAMP

The camp is policed by the park rangers. Every day toward evening one of the rangers from the near-by station visits the camp to see that the camp fires are cared for so as to prevent forest fires, to note the cleanliness of the camp, to instruct the campers re-

garding camp clean-up before departure, and to count the number of cars in the camp.

In addition to the foregoing, each car is checked upon entering and leaving the park at the four exits. Upon entrance, a permit is issued, the charge for which is $7.50 per car. The permit is as follows:

No. 20758

DEPARTMENT OF THE INTERIOR, NATIONAL PARK SERVICE

YELLOWSTONE NATIONAL PARK AUTOMOBILE PERMIT

---------- (Issuing station) ---------- (Date)

---------- (State) ---------- (License No.) ---------- (Make)

Fee paid by and permit issued to: ---------- (Name of owner or of driver)

Address ----------

---------- ----------

---------- (Number of passengers) ---------- (Number of firearms)

---------- (Number of dogs) ---------- (Breed)

NOTE.—This permit is issued and accepted subject to the regulations governing the park, and entitles the permittee to right of passage over any or all of the roads open to traffic within the park. It is void after December 31 of the year of issue, is not transferable, and if lost can not be duplicated. It must be conveniently kept and must be exhibited to park rangers on demand. Any erasure makes this permit void.

This permit system affords a close check on the automobiles and has time and again resulted in the apprehension and punishment of some motorist who has committed a misdemeanor in the park.

The camp was opened on July 26, 1924, and closed on September 15. The number of automobiles in the camp daily is given in the following table:

Number of automobiles daily in Canyon automobile camp, 1924

Date	Number	Date	Number	Date	Number	Date	Number
July 26	125	Aug. 8	158	Aug. 21	99	Sept. 3	50
27	130	9	149	22	86	4	45
28	123	10	99	23	82	5	23
29	143	11	123	24	71	6	32
30	160	12	153	25	56	7	39
31	120	13	161	26	60	8	18
Aug. 1	110	14	120	27	50	9	26
2	115	15	115	28	55	10	20
3	88	16	130	29	50	11	23
4	135	17	122	30	65	12	17
5	142	18	90	31	60	13	16
6	148	19	98	Sept. 1	52	14	15
7	149	20	115	2	54	15	10

The table shows a total of 4,495 cars on 52 days, or a daily average of over 86 automobiles. The number of cars actually staying at the camp is greater, owing to the arrival of cars at night, after the

count. Records in Yellowstone show that each car contains on the average 3.32 people. This would indicate a total attendance of 14,923 people for the above period, or a daily average of 287 people.

SUMMARY

In order to take care of the many automobile tourists in Yellowstone National Park, camps with many comforts and sanitary conveniences are being laid out as rapidly as funds are made available. The Canyon Automobile Camp, the latest to be opened, was completed at the end of the 1924 park season. The water supply, sewerage system, garbage and refuse disposal, mosquito-control measures, stores, service facilities, policing, and management of this camp are described in this paper. Of particular interest are the rustic type of comfort station and the tables and benches installed in the camp.

Acknowledgments.—The writer wishes to acknowledge his appreciation to Superintendent Albright and Master Plumber Wiggins, of Yellowstone National Park, for their assistance in furnishing data for this paper.

CURRENT WORLD PREVALENCE OF DISEASE

REVIEW OF THE MONTHLY EPIDEMIOLOGICAL REPORT FOR APRIL 15, 1925,[1] ISSUED BY THE HEALTH SECTION OF THE LEAGUE OF NATIONS' SECRETARIAT

The Far Eastern Bureau of the Epidemiological Intelligence Service of the Health Section of the League of Nations is now functioning,[2] and telegraphic information for three weeks (March 22 to April 11) is included in the Monthly Epidemiological Report, issued April 15 at Geneva. This bureau "already receives weekly telegraphic reports on the sanitary situation in the principal ports of the Dutch East Indies, Federated Malay States, Philippine Islands, Straits Settlements, and in Hongkong. Similar reports have been promised by the health services of other countries in the Far East and are expected to be available shortly. The information received is being broadcast every Friday from the wireless station of the Government of French Indo-China for the use of health services interested." Thus an exchange of epidemiological data is effected between important ports in the Far East with great promptness, and the information is made available in the Epidemiological Report several weeks earlier than was formerly possible.

These telegraphic reports refer chiefly to plague, cholera, and smallpox; but any other serious epidemic disease is to be reported.

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[1] From the Statistical Office, United States Public Health Service.

[2] See Public Health Reports, May 1, 1925, p. 896.

In the April Epidemiological Report the weekly mortality rates (all causes) for the usual group of large cities are given to or including March. These rates seem to indicate that the winter season of 1924–25 has been generally more favorable in the European cities than the winter season of 1923–24. The epidemics of mild influenza in some parts of Europe, referred to previously in these reviews, never became serious, and no other epidemics have occurred to accentuate the normal seasonal rise in the winter months. The mortality was lower during the past winter than in the preceding winter, particularly in the cities of Central Europe and in England and Wales. The rates in the following table are averages of the weekly annual rates published in the Report and give the annual rates for periods of four weeks.

TABLE 1.—*General mortality rates by four-week periods*[1] *(on annual basis) for a number of European cities in the winters of 1923–24 and 1924–25*

Date,[2] 4 weeks ending—	105 English towns		Paris[3]		Amsterdam		Copenhagen	
	1923–24	1924–25	1923–24	1924–25	1923–24	1924–25	1923–24	1924–25
Dec. 27	14.2	12.1	16.1	16.1	10.0	10.3	11.8	10.8
Jan. 24	14.6	14.2	19.2	17.0	11.7	10.6	13.5	11.4
Feb. 21	17.2	14.8	17.1	17.1	10.7	9.4	13.1	12.3
Mar. 21	19.4	15.0	[4] 20.4	[4] 17.6	[4] 9.7	[4] 10.0	15.8	13.1
	46 German towns		Warsaw		Budapest		Milan[5]	
	1923–24	1924–25	1923–24	1924–25	1923–24	1924–25	1923–24	1924–25
Dec. 27	12.6	11.5	14.8	12.7	17.8	15.0	13.3	12.9
Jan. 24	13.0	12.0	17.7	15.1	19.3	16.0	14.4	13.8
Feb. 21	13.0	11.8	18.4	14.2	23.9	17.6	15.2	15.7
Mar. 21	[4] 14.1	[4] 12.0	[4] 16.5	[4] 14.6	[4] 24.5	[4] 19.2	-------	-------

[1] Weekly rates on an annual basis were averaged for the four-week periods indicated.
[2] Dates are for 1924–25 season; corresponding periods in 1923–24 are given.
[3] Original data are by 10-day periods; average of three periods has been used, i. e., for calendar month.
[4] Three weeks only—average for period Feb. 22 to Mar. 14, except for Paris, where average is for two 10-day periods.
[5] Rates are for calendar months December, January, and February.

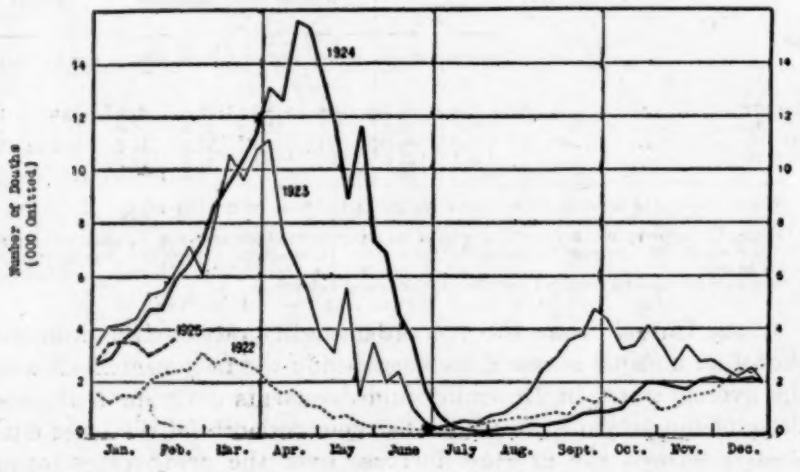
In the United States the average mortality rates for 60 cities have shown no unusual seasonal increase during the past winter, although the average rates in December and January were somewhat above those of the previous winter in the same period. Of the large cities, Boston showed the greatest increase over the death rates for the 1923–24 winter, whereas in San Francisco the rate was more favorable this winter than in the preceding winter.

TABLE 2.—*General mortality rates by four-week periods in certain cities of the United States, compared for 1924–25*

City and year	Average mortality rate (annual basis) for 4 weeks ending—			
	Dec. 27	Jan. 25	Feb. 21	Mar. 21
60 cities:				
1924–25	13.2	14.4	14.3	14.6
1923–24	12.4	13.5	14.0	14.6
Boston:				
1924–25	15.2	16.7	18.1	18.2
1923–24	13.9	15.4	15.4	15.4
New York:				
1924–25	12.5	13.8	13.8	13.2
1923–24	11.2	12.6	13.3	14.1
Chicago:				
1924–25	11.9	13.0	12.8	13.7
1923–24	11.4	12.5	12.5	12.8
New Orleans:				
1924–25	19.9	21.0	23.4	20.4
1923–24	18.8	20.4	23.3	21.0
San Francisco:				
1924–25	14.5	15.7	14.0	13.0
1923–24	15.4	16.6	14.7	14.6

Plague.—With the exception of two cases of plague in Egypt, one in the Province of Minia reported April 1 and one fatal case at Suez on April 2, the countries bordering on the Mediterranean reported no case of plague in the month intervening between the publication of the March and April issues of the Epidemiological Report.

WEEKLY PLAGUE MORTALITY IN BRITISH INDIA



The plague incidence in India is the lowest for this time of year since 1922. In the four weeks ended February 14, there were 13,496 deaths notified, a slight increase over the previous four weeks' total of 11,759 deaths. The increase occurred mostly in the Punjab and the United Provinces.

In Java, where the number of deaths from plague in December, 1924, was 3,041—the highest ever recorded—there was a marked decline in the number of deaths reported during January, a total of 2,110 deaths having been notified from January 1 to 28. "The province of Banjumas, in which plague has been very prevalent since June, 1924, has never before been infected," states the Report, otherwise the epidemic has been restricted to those Central Provinces which had already been infected and had regularly reported the majority of plague deaths in Java.

Plague incidence was relatively low in the infected areas of Africa in December and January, and it has been declining in most countries. Only 7 new cases were reported in the Union of South Africa during the 3 weeks ending March 17 as compared with 26 from February 1–25. In Madagascar, on the other hand, 228 cases of plague were reported in February as compared with 143 in January.

Cholera.—Cases of cholera were reported from Ceylon, Indo-China, Siam, and British India in the month preceding that of the publication of the Epidemiological Report. The number of cases reported was as follows:

Locality	Date	Number of cases	Number of deaths
Ceylon	Feb. 22–Mar. 21	8	8
British India	Jan. 11–Feb. 7	10,759	6,418
Indo-China:			
Cochin-China	January	5	
Do	February	4	
Cambodia	January	5	
Siam	Jan. 25–Feb. 21	8	5

Little change is shown in the incidence of cholera in India as compared with the previous four weeks' period. The Report states: "Nearly all the cases occurred in the Presidencies of Madras and Bengal. Madras was more heavily infected than during the corresponding season of 1924, four-fifths of all the cases reported in India occurring here. Cholera never disappears from Bengal, and its fluctuations here are smaller than in the rest of India."

Typhus and relapsing fever.—The January reports for Russia showed little increase in the cases of typhus in most of the governments from which data were available. The governments of Nijni Novgorod, with 495 cases, and Riasan, with 346 cases, reported the largest number; the government of Pskov, where typhus has not been prevalent in recent years, reported 205 cases as against 124 in December, 1924. Only 1 death from typhus was reported in January in the city of Moscow. Cases of relapsing fever in Russia numbered about one-sixth of the typhus cases.

In Poland, there were 503 cases of typhus reported during February, fewer than in the corresponding period of each of the preceding three

years. Only 10 cases of relapsing fever were notified during February.

The incidence of typhus fever in the Union of South Africa also has steadily diminished since 1922. In January, 1925, 96 cases were reported.

Smallpox.—"Smallpox cases were reported during the first months of 1925 from England, France, Switzerland, Spain, Greece, and Russia; the disease was practically absent from the rest of Europe," states the Report. The course of the disease in the past year in the above-mentioned European countries and in a number of non-European countries is shown in Table 3.

TABLE 3.—*Cases of smallpox notified in various countries, 1924–25*

Four weeks ending—	England and Wales	Switzerland	Poland	Egypt	India (deaths)	Java	Hongkong	United States
1924								
Jan. 26	364	250	94	32	1,810	304	396	3,604
Feb. 23	199	333	114	35	2,407	349	290	4,591
Mar. 22	337	162	215	86	3,414	243	148	4,997
Apr. 19	400	134	163	127	3,733	281	56	5,334
May 17	454	100	86	132	3,166	241	32	4,828
June 14	301	85	97	116	2,597	336	10	3,865
July 12	242	51	17	54	2,245	241	4	2,565
Aug. 9	167	15	23	42	1,332	490	0	1,055
Sept. 6	206	34	19	41	783	902	0	777
Oct. 4	203	35	4	47	667	1,005	0	968
Nov. 1	223	14	7	38	652	753	0	1,340
Nov. 29	318	11	10	12	831	511	1	2,101
Dec. 27	285	8	11	37	1,319	413	4	2,437
1925								
Jan. 24	416	19	10	8	2,242	364	18	3,540
Feb. 21	593	70	5	31	----------	----------	13	4,276
Mar. 21	533	----------	----------	----------	----------	----------	----------	3,592

Months	Russia	Greece	Spain (deaths)	France	Algeria	Tunis	Japan	Canada
1924								
January	2,639	6	64	12	7	25	462	505
February	3,679	20	34	25	19	14	451	553
March	3,456	26	34	19	8	29	282	385
April	3,518	38	14	23	7	17	297	307
May	2,935	31	22	15	10	19	83	245
June	2,002	49	38	32	12	21	67	137
July	1,047	20	75	17	9	19	51	66
August	567	8	127	20	5	45	1	83
September	683	4	158	9	61	34	2	93
October	650	5	187	15	67	80	1	185
November	718	2	209	8	111	163	0	112
December	861	2	252	15	156	140	5	120
1925								
January	----------	39	----------	10	170	135	----------	206
February	----------	----------	----------	37	126	156	----------	218

Influenza.—In most countries influenza was less prevalent during the past winter than in the corresponding season a year ago, and the epidemics which were reported seem to have been very mild. In England and Wales the mortality from influenza was only about one-half that in the preceding year.

Influenza is reported to have been widespread in Russia during the winter, but the type was mild.

Lethargic encephalitis.—The incidence of lethargic encephalitis continued high in England and Wales in comparison with that reported by other countries. Although the number of cases in England was increasing slightly during the first quarter, the March incidence was less than in the same period of 1924.

Number of cases of lethargic encephalitis in England and Wales in the first quarter of 1923, 1924, and 1925

Four weeks ending—	1923	1924	1925
Jan. 26	66	56	194
Feb. 23	151	150	231
Mar. 22	184	397	261
Apr. 19	145	806	----------

Poliomyelitis.—In New Zealand an outbreak of poliomyelitis began during the latter part of November and seems to have reached its maximum the middle of February. "Cases occurred in all the provinces," according to the Report. From November 10 to February 23, 622 cases and 80 deaths were reported. The weekly figures are given below:

Number of cases of poliomyelitis reported in New Zealand

Week ending—	1924		Week ending—	1925	
	Cases	Deaths		Cases	Deaths
Nov. 10	0	0	Jan. 5	19	2
Nov. 17	0	0	Jan. 12	30	4
Nov. 24	1	1	Jan. 19	60	4
Dec. 1	3	0	Jan. 26	58	9
Dec. 8	6	0	Feb. 2	88	16
Dec. 15	13	4	Feb. 9	104	19
Dec. 22	11	2	Feb. 16	138	6
Dec. 29	12	3	Feb. 23	79	10

Scarlet fever.—Scarlet fever was more prevalent during the past winter than during the preceding two winters in the Netherlands, Germany, Austria, Poland, and Russia. The February reports showed a lower incidence of scarlet fever in nearly all European countries.

Diphtheria.—The incidence of diphtheria was somewhat higher during the winter of 1924–25 than in the winter of 1923–24 in western, central, and northern Europe. The lowest incidence in recent months has been reported from eastern Europe.

REPORT OF ADVISORY COMMITTEE ON OFFICIAL WATER STANDARDS—CORRECTION

In the Report of Advisory Committee on Official Water Standards, published in Public Health Reports for April 10, 1925, the "equation of probability curve" for Case a (first line in the table on page 707) should read $y = 50e^{-50\lambda}$ instead of $y = 50e^{-\lambda}$.

DEATHS DURING WEEK ENDED MAY 23, 1925

Summary of information received by telegraph from industrial insurance companies for week ended May 23, 1925, and corresponding week of 1924. (From the Weekly Health Index, May 28, 1925, issued by the Bureau of the Census, Department of Commerce)

	Week ended May 23, 1925	Corresponding week, 1924
Policies in force	59, 943, 647	56, 109, 722
Number of death claims	11, 906	11, 057
Death claims per 1,000 policies in force, annual rate	10. 4	10. 3

Deaths from all causes in certain large cities of the United States during the week ended May 23, 1925, infant mortality, annual death rate, and comparison with corresponding week of 1924. (From the Weekly Health Index, May 28, 1925, issued by the Bureau of the Census, Department of Commerce)

City	Week ended May 23, 1925		Annual death rate per 1,000 corresponding week, 1924	Deaths under 1 year		Infant mortality rate, week ended May 23, 1925 [2]
	Total deaths	Death rate [1]		Week ended May 23, 1925	Corresponding week, 1924	
Total (65 cities)	6,807	12.8	[3] 12.4	804	[3] 833	
Akron	35			6	1	66
Albany [4]	38	16.6	17.6	5	2	111
Atlanta	83			13	6	
Baltimore [4]	230	15.1	14.1	19	27	56
Birmingham	75	19.0	17.4	9	8	
Boston	232	15.4	13.6	40	21	106
Bridgeport	26			2	4	32
Buffalo	130	12.2	12.1	20	15	81
Cambridge	23	10.7	12.6	1	3	17
Camden	27	10.9	12.4	3	2	49
Chicago [4]	659	11.5	12.5	81	136	72
Cincinnati	124	15.8	15.5	13	13	77
Cleveland	184	10.2	10.6	24	31	60
Columbus	67	12.5	11.1	7	7	66
Dallas	44	11.9	12.2	6	6	
Dayton	20	7.8	9.6	2	1	32
Denver	78	14.5	13.6	9	10	
Des Moines	38	13.3	10.4	4	1	69
Detroit	267			55	48	93
Duluth	17	8.0	14.0	0	5	0
Erie	21			2	4	39
Fall River [4]	26	11.2	13.4	3	5	43
Flint	20	8.0	4.2	3	2	49
Fort Worth	41	14.0	5.3	4	2	
Grand Rapids	44	15.0	5.6	9	1	140
Houston	50	15.8	12.7	9	5	
Indianapolis	80	11.6	11.1	7	11	48
Jersey City	70	11.6	13.2	11	10	77
Kansas City, Kans	26	11.0	11.1	1	1	21
Kansas City, Mo	94	13.3	14.1	7	12	

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births—an annual rate based on deaths under 1 year for the week and estimated births for 1924. Cities left blank are not in the registration area for births.
[3] Data for 64 cities.
[4] Deaths for week ended Friday, May 22, 1925.

Deaths from all causes in certain large cities of the United States during the week ended May 23, 1925, infant mortality, annual death rate, and comparison with corresponding week of 1924—Continued

City	Week ended May 23, 1925		Annual death rate per 1,000 corresponding week, 1924	Deaths under 1 year		Infant mortality rate, week ended May 23, 1925
	Total deaths	Death rate		Week ended May 23, 1925	Corresponding week, 1924	
Los Angeles	215			32	32	89
Louisville	84	16.9	20.0	7	7	61
Lowell	31	13.9	13.5	6	8	104
Lynn	19	9.5	5.5	4	1	106
Memphis	70	20.9	13.9	13	3	
Milwaukee	145	15.1	10.3	21	22	96
Minneapolis	96	11.8	12.2	9	12	48
Nashville [1]	48	18.4	19.4	7	5	
New Bedford	22	8.5	10.2	1	4	17
New Haven	42	12.2	8.0	3	4	39
New Orleans	165	20.8	18.8	29	11	
New York	1,415	12.1	12.1	176	173	70
Bronx Borough	155	9.0	9.8	16	16	55
Brooklyn Borough	496	11.6	11.2	63	57	66
Manhattan Borough	610	14.1	14.2	82	79	82
Queens Borough	114	10.4	11.1	13	20	65
Richmond Borough	40	15.6	11.6	2	1	36
Newark, N. J	94	10.8	10.8	9	13	41
Norfolk	33			6	8	107
Oakland	41	8.4	10.1	4	4	47
Oklahoma City	23			4	9	
Omaha	42	10.3	12.5	5	6	48
Paterson	48	17.7	7.8	7	2	117
Philadelphia	518	13.6	12.0	57	47	72
Pittsburgh	179	14.8	12.8	23	28	81
Portland, Oreg	79	14.6	13.3	6	8	62
Providence	59	12.6	10.9	9	8	72
Richmond	51	14.3	16.2	5	9	61
Rochester	87	13.7	11.7	12	4	95
St. Louis	217	13.8	12.8	12	22	
St. Paul	81	17.2	10.7	5	4	43
Salt Lake City [1]	30	11.9	12.2	2	3	31
San Antonio	46	12.1	17.7	10	17	
San Francisco	135	12.6	10.9	18	8	104
Schenectady	16	8.2	11.4	1	3	28
Seattle	68			10	8	102
Somerville	31	15.8	13.0	2	2	54
Spokane	33	15.8	10.0	2	2	44
Springfield, Mass	33	11.3	9.1	4	1	60
Syracuse	57	15.5	13.0	5	6	63
Tacoma	17	8.5	10.6	2	3	48
Toledo	57	10.3	12.8	7	10	63
Trenton	33	13.0	14.1	1	8	16
Utica	32	15.6		2		41
Washington, D. C	106	11.1	13.0	9	11	51
Waterbury	27			5	2	111
Wilmington, Del	27	11.5	10.0	5	2	114
Worcester	35	9.2	16.3	2	8	23
Yonkers	21	9.8	10.9	4	3	88
Youngstown	22	7.2	12.8	1	4	13

[1] Deaths for week ended Friday, May 22, 1925.

DEATHS DURING WEEK ENDED MAY 30, 1925

Summary of information received by telegraph from industrial insurance companies for week ended May 30, 1925, and corresponding week of 1924. (From the Weekly Health Index, June 2, 1925, issued by the Bureau of the Census, Department of Commerce)

	Week ended May 30, 1925	Corresponding week, 1924
Policies in force	60, 037, 150	56, 210, 959
Number of death claims	10, 495	8, 300
Death claims per 1,000 policies in force, annual rate	9. 1	7. 7

Deaths from all causes in certain large cities of the United States during the week ended May 30, 1925, infant mortality, annual death rate, and comparison with corresponding week of 1924. (From the Weekly Health Index, June 2, 1925, issued by the Bureau of the Census, Department of Commerce)

City	Week ended May 30, 1925		Annual death rate per 1,000 corresponding week, 1924	Deaths under 1 year		Infant mortality rate, week ended May 30, 1925 [2]
	Total deaths	Death rate [1]		Week ended May 30, 1925	Corresponding week, 1924	
Total (64 cities)	6, 371	12. 4	[3] 12. 1	724	763	
Akron	33			6	11	66
Albany [4]	36	15. 7	15. 8	1	3	22
Atlanta	88			16	8	
Baltimore [4]	235	15. 4	13. 1	23	20	67
Birmingham	75	19. 0	15. 6	12	11	
Boston	208	13. 8	13. 2	23	25	61
Bridgeport	24			2	4	32
Buffalo	117	11. 0	11. 4	12	18	49
Cambridge	33	15. 3	11. 6	8	4	138
Camden	43	17. 4	15. 3	4	3	66
Chicago [4]	699	12. 2	11. 1	100	92	88
Cincinnati	113	14. 4	15. 5	7	12	41
Cleveland	152	8. 5	9. 6	17	31	42
Columbus	70	13. 0	13. 6	8	7	75
Dallas	65	17. 5	13. 3	14	5	
Dayton	28	8. 4	11. 7	3	8	48
Denver	71	13. 2	11. 9	6	7	
Des Moines	17	5. 9	11. 9	4	1	69
Detroit	231			36	54	61
Duluth	18	8. 5	7. 7	0	2	0
Erie	37			4	2	78
Fall River [4]	32	13. 8	15. 5	7	7	101
Flint	18	7. 2	8. 8	5	3	82
Fort Worth	37	12. 7	8. 4	4	5	
Grand Rapids	32	10. 9	9. 1	1	3	16
Houston	42	13. 3	13. 0	10	4	
Indianapolis	77	11. 2	13. 8	5	8	34
Jersey City	74	12. 2	13. 9	6	9	42
Kansas City, Kans	33	13. 9	10. 7	1	2	21
Kansas City, Mo	72	10. 2	10. 0	10	6	
Los Angeles	187			19	31	53
Louisville	59	11. 9	15. 3	0	4	0
Lowell	21	9. 4	13. 1	1	4	17
Lynn	14	7. 0	9. 1	2	1	53
Memphis	60	17. 9	18. 8	7	6	
Milwaukee	130	13. 5	9. 7	20	12	91
Minneapolis	77	9. 4	10. 2	6	13	32
Nashville [4]	40	15. 3	21. 1	5	5	
New Bedford	30	11. 6	9. 8	7	5	116
New Haven	25	7. 3	11. 6	6	2	78
New Orleans	145	18. 2	19. 0	21	17	

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births—an annual rate based on deaths under 1 year for the week and estimated births for 1924. Cities left blank are not in the registration area for births.
[3] Data for 63 cities.
[4] Deaths for week ended Friday, May 29, 1925.

Deaths from all causes in certain large cities of the United States during the week ended May 30, 1925, infant mortality, annual death rate, and comparison with corresponding week of 1924—Continued

City	Week ended May 30, 1925		Annual death rate per 1,000 corresponding week, 1924	Deaths under 1 year		Infant mortality rate, week ended May 30 1925
	Total deaths	Death rate		Week ended May 30, 1925	Corresponding week, 1924	
New York	1,398	11.9	11.9	152	160	61
Bronx Borough	166	9.6	9.9	15	18	52
Brooklyn Borough	474	11.1	10.4	65	53	68
Manhattan Borough	612	14.1	14.9	58	79	38
Queens Borough	114	10.4	8.6	12	9	60
Richmond Borough	32	12.5	10.8	2	1	36
Newark, N. J	88	10.1	9.6	14	9	64
Norfolk	37			5	3	89
Oakland	41	8.4	11.4	3	8	35
Oklahoma City	22			1	0	
Omaha	67	16.5	10.3	10	3	96
Paterson	27	9.9	11.5	7	2	117
Philadelphia	518	13.6	12.5	52	60	65
Pittsburgh	148	12.2	13.8	18	22	63
Portland, Oreg	53	9.8	11.6	3	3	31
Providence	66	14.0	15.0	7	14	56
Richmond	64	17.9	12.5	11	6	133
Rochester	90	14.2	12.8	6	11	47
St Paul	43	9.1	11.8	1	8	9
Salt Lake City [1]	31	12.3	11.8	2	5	31
San Antonio	61	16.1	14.7	9	16	
San Francisco	112	10.5	13.4	7	11	40
Schenectady	22	11.2	6.7	0	1	0
Seattle	67			7	4	71
Somerville	21	10.7	7.8	3	1	80
Spokane	28	13.4	12.5	2	1	44
Springfield, Mass	31	10.6	10.5	2	4	30
Syracuse	25	6.8	13.9	2	10	25
Tacoma	15	7.5	9.1	1	2	24
Toledo	72	13.1	11.2	8	9	72
Trenton	43	17.0	13.7	5	4	81
Utica	37	18.1		4		82
Washington, D. C	144	15.1	12.5	18	10	101
Waterbury	22			3	3	66
Wilmington, Del	20	8.5	11.7	3	3	68
Worcester	54	14.2	8.3	4	4	46
Yonkers	24	11.2	13.3	1	5	22
Youngstown	30	9.8	11.8	3	6	38

[1] Deaths for week ended Friday May 29, 1925.

45488°—25†——3

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Week Ended June 6, 1925

ALABAMA	Cases
Chicken pox	7
Diphtheria	5
Dysentery	49
Influenza	20
Malaria	75
Measles	2
Mumps	14
Pellagra	14
Pneumonia	23
Poliomyelitis	1
Scarlet fever	7
Smallpox	72
Trachoma	5
Tuberculosis	71
Typhoid fever	69
Whooping cough	49

ARIZONA	
Chicken pox	7
Diphtheria	1
Measles	10
Mumps	2
Poliomyelitis	2
Scarlet fever	2
Tuberculosis	7
Typhoid fever	50
Whooping cough	6

ARKANSAS	
Chicken pox	8
Diphtheria	2
Hookworm disease	1
Influenza	34
Malaria	108
Measles	56
Mumps	17
Ophthalmia neonatorum	1
Paratyphoid fever	5
Pellagra	30
Poliomyelitis	1
Scarlet fever	5
Smallpox	2
Trachoma	1
Tuberculosis	17
Typhoid fever	23
Whooping cough	12

CALIFORNIA	Cases
Anthrax—Los Angeles	1
Diphtheria	86
Influenza	19
Leprosy—Los Angeles County	1
Lethargic encephalitis—Los Angeles	1
Measles	84
Poliomyelitis:	
Berkeley	1
Fresno	1
Healdsburg	1
Long Beach	1
Los Angeles	4
Oakland	2
San Francisco	4
Santa Cruz	1
Los Angeles County	2
Yolo County	1
Scarlet fever	120
Smallpox:	
Berkeley	10
Los Angeles	35
Los Angeles County	7
Oakland	24
San Diego	12
Scattering	31
Typhoid fever	12

COLORADO (Exclusive of Denver)	
Chicken pox	13
Diphtheria	29
Measles	2
Mumps	13
Paratyphoid fever	1
Pneumonia	6
Scarlet fever	23
Septic sore throat	1
Smallpox	1
Tuberculosis	91
Typhoid fever	2
Vincent's angina	1
Whooping cough	8

CONNECTICUT

	Cases
Chicken pox	82
Diphtheria	34
German measles	40
Influenza	4
Lethargic encephalitis	1
Measles	366
Mumps	56
Pneumonia (all forms)	46
Scarlet fever	66
Septic sore throat	2
Tetanus	1
Tuberculosis (all forms)	32
Typhoid fever	3
Whooping cough	150

DELAWARE

Chicken pox	1
Diphtheria	1
Influenza	1
Measles	7
Mumps	4
Pneumonia	2
Scarlet fever	2
Tuberculosis	6
Typhoid fever	2

FLORIDA

Cerebrospinal meningitis	1
Chicken pox	24
Diphtheria	6
Malaria	7
Measles	6
Mumps	84
Poliomyelitis	1
Scarlet fever	5
Smallpox	5
Tetanus	1
Tuberculosis	11
Typhoid fever	12
Whooping cough	10

GEORGIA

Cerebrospinal meningitis	4
Chicken pox	36
Diphtheria	10
Dysentery	77
Hookworm disease	7
Influenza	38
Malaria	73
Measles	26
Mumps	41
Paratyphoid fever	1
Pellagra	19
Pneumonia	43
Scarlet fever	3
Septic sore throat	10
Smallpox	26
Tetanus	1
Tuberculosis	62
Typhoid fever	65
Whooping cough	54

ILLINOIS

Cerebrospinal meningitis:	
Cook County	3
Kankakee County	1

ILLINOIS—continued

	Cases
Diphtheria:	
Cook County	85
Scattering	13
Influenza	21
Lethargic encephalitis	5
Measles	1,458
Pneumonia	262
Poliomyelitis:	
Christian County	1
McClean County	1
Scarlet fever:	
Champaign County	6
Clinton County	6
Cook County	245
Jackson County	5
Kane County	6
Ogle County	7
St. Clair County	5
Sangamon County	7
Stephenson County	7
Vermilion County	5
Scattering	59
Smallpox:	
Champaign County	3
Cook County	8
Franklin County	6
Jackson County	3
Pulaski County	3
Woodford County	17
Scattering	23
Tuberculosis	310
Typhoid fever:	
Cook County	6
Scattering	19
Whooping cough	328

INDIANA

Chicken pox	94
Diphtheria	26
Influenza	28
Measles	245
Mumps	1
Pneumonia	2
Scarlet fever:	
Allen County	27
Elkhart County	18
Laporte County	9
Marion County	9
St. Joseph County	20
Scattering	51
Smallpox	63
Trachoma	1
Tuberculosis	50
Typhoid fever	14
Whooping cough	41

IOWA

Diphtheria	9
Scarlet fever	24
Smallpox	12
Typhoid fever	1

KANSAS

Chicken pox	43
Diphtheria	7
German measles	1
Influenza	8

KANSAS—continued

	Cases
Measles	6
Mumps	77
Pneumonia	11
Poliomyelitis	1
Scarlet fever	31
Smallpox	5
Tuberculosis	59
Typhoid fever	4
Whooping cough	68

LOUISIANA

Cerebrospinal meningitis	1
Diphtheria	6
Influenza	16
Leprosy	1
Malaria	24
Pneumonia	58
Scarlet fever	22
Smallpox	6
Tuberculosis	45
Typhoid fever	59

MAINE

Chicken pox	12
Diphtheria	3
German measles	3
Influenza	8
Measles	9
Mumps	96
Pneumonia	8
Poliomyelitis	1
Scarlet fever	11
Tuberculosis	14
Typhoid fever	1
Vincent's angina	1
Whooping cough	5

MARYLAND

Cerebrospinal meningitis	2
Chicken pox	99
Diphtheria	26
Ileocolitis	2
Influenza	19
Malaria	1
Measles	65
Mumps	63
Pneumonia:	
Broncho	17
Lobar	40
Scarlet fever	54
Septic sore throat	3
Smallpox	3
Tuberculosis	70
Vincent's angina	2
Whooping cough	110
Typhoid fever	11

MASSACHUSETTS

Cerebrospinal meningitis	1
Chicken pox	193
Conjunctivitis (suppurative)	21
Diphtheria	100
German measles	359
Hookworm disease	2
Influenza	8
Lethargic encephalitis	2
Measles	888
Mumps	55

MASSACHUSETTS—continued

	Cases
Ophthalmia neonatorum	22
Pellagra	2
Pneumonia (lobar)	75
Poliomyelitis	1
Scarlet fever	219
Septic sore throat	2
Tetanus	2
Trachoma	4
Trichinosis	4
Tuberculosis:	
Pulmonary	130
Other forms	67
Typhoid fever	5
Whooping cough	140

MICHIGAN

Diphtheria	84
Measles	711
Pneumonia	221
Scarlet fever	391
Smallpox	27
Tuberculosis	79
Typhoid fever	10
Whooping cough	289

MINNESOTA

Chicken pox	206
Diphtheria	60
Influenza	3
Measles	29
Pneumonia	1
Scarlet fever	181
Smallpox	11
Tuberculosis	55
Typhoid fever	1
Whooping cough	30

MISSISSIPPI

Diphtheria	5
Scarlet fever	1
Smallpox	8
Typhoid fever	11

MONTANA

Cerebrospinal meningitis	1
Chicken pox	6
Diphtheria	1
German measles	12
Measles	14
Mumps	35
Scarlet fever	51
Smallpox	10
Tuberculosis	4
Typhoid fever	3
Whooping cough	17

NEW JERSEY

Cerebrospinal meningitis	4
Chicken pox	195
Diphtheria	81
Influenza	2
Measles	494
Pneumonia	140
Poliomyelitis	3
Scarlet fever	224
Smallpox	10
Trachoma	1
Trichinosis	2
Typhoid fever	10
Whooping cough	187

NEW MEXICO

	Cases
Chicken pox	9
Diphtheria	3
German measles	2
Malaria	1
Measles	7
Mumps	4
Pellagra	2
Pneumonia	7
Rabies in animals	2
Scarlet fever	5
Trachoma	1
Tuberculosis	9
Tularaemia	1
Typhoid fever	2
Whooping cough	2

NEW YORK

(Exclusive of New York City)

Diphtheria	100
Influenza	55
Measles	865
Pneumonia	294
Poliomyelitis	1
Scarlet fever	255
Smallpox	55
Typhoid fever	21
Whooping cough	199

NORTH CAROLINA

Chicken pox	59
Diphtheria	25
German measles	4
Measles	20
Scarlet fever	14
Smallpox	49
Typhoid fever	13
Whooping cough	98

OKLAHOMA

(Exclusive of Oklahoma City and Tulsa)

Cerebrospinal meningitis—Beckham	1
Chicken pox	13
Diphtheria	11
Influenza	49
Measles	5
Mumps	14
Pneumonia	29
Scarlet fever:	
Washington	8
Scattering	19
Smallpox	9
Typhoid fever:	
Stephens	16
Scattering	28
Whooping cough	26

OREGON

Cerebrospinal meningitis	3
Chicken pox	19
Diphtheria:	
Portland	15
Scattering	10
Influenza	3
Measles	4
Mumps	21
Pneumonia	[1]2

OREGON—continued

	Cases
Rocky Mountain spotted fever	1
Scarlet fever	11
Smallpox:	
Malheur County	13
Scattering	7
Tuberculosis	23
Typhoid fever	3
Whooping cough	19

SOUTH DAKOTA

Measles	7
Mumps	2
Pneumonia	3
Scarlet fever	34
Smallpox	4
Typhoid fever	3
Whooping cough	2

VERMONT

Chicken pox	28
Diphtheria	1
Measles	17
Mumps	7
Scarlet fever	15
Whooping cough	6

VIRGINIA

Smallpox:	
Henry County	1
Prince George County	1

WASHINGTON

Chicken pox	114
Diphtheria	33
German measles	22
Leprosy—King County	1
Measles	12
Mumps	101
Scarlet fever	46
Smallpox	38
Tuberculosis	19
Typhoid fever	4
Whooping cough	200

WEST VIRGINIA

Diphtheria	4
Scarlet fever	12
Smallpox	3
Typhoid fever	4

WISCONSIN

Milwaukee:	
Chicken pox	36
Diphtheria	12
German measles	48
Lethargic encephalitis	1
Measles	154
Mumps	56
Pneumonia	13
Scarlet fever	12
Smallpox	40
Trachoma	1
Tuberculosis	25
Whooping cough	33
Scattering:	
Chicken pox	101
Diphtheria	30
German measles	172
Influenza	78
Measles	222

[1] Deaths.

WISCONSIN—continued

Scattering—Continued	Cases
Mumps	126
Pneumonia	21
Poliomyelitis	1
Scarlet fever	58
Smallpox	19
Tuberculosis	17
Typhoid fever	2
Whooping cough	66

WYOMING

	Cases
Chicken pox	5
Diphtheria	1
Influenza	1
Mumps	7
Pneumonia	3
Rocky Mountain spotted fever—Johnson	1
Scarlet fever	1
Whooping cough	8

Reports for Week Ended May 30, 1925

DISTRICT OF COLUMBIA

	Cases
Cerebrospinal meningitis	1
Chicken pox	9
Diphtheria	12
Influenza	1
Measles	28
Pneumonia	20
Scarlet fever	17
Tuberculosis	27
Typhoid fever	3
Whooping cough	19

NORTH DAKOTA

	Cases
Chicken pox	11
Diphtheria	2
German measles	3
Measles	3
Pneumonia	6
Scarlet fever	13
Smallpox	8
Trachoma	1
Tuberculosis	1
Whooping cough	10

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week.

State	Cerebrospinal meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
April, 1925										
Colorado	----	86	35	----	28	----	----	107	2	8
Iowa	1	65	----	----	37	----	2	131	37	3
May, 1925										
Arizona	1	6	24	----	396	----	----	23	3	12

PLAGUE-ERADICATIVE MEASURES IN THE UNITED STATES

The following items were taken from the reports of plague-eradicative measures from the cities named:

Los Angeles, Calif.

Week ended May 23, 1925:

Number of rats examined	2,525
Number of rats found to be plague infected	1
Number of squirrels examined	1,247
Number of squirrels found to be plague infected	1

Totals, Nov. 5, 1924, to May 23, 1925:

Number of rats examined	104,409
Number of rats found to be plague infected	187
Number of squirrels examined	14,924
Number of squirrels found to be plague infected	9

Deat of discovery of last plague-infected rodent, May 26, 1925.

Date of last human case, Jan. 15, 1925.

Oakland, Calif.

(Including other East Bay communities)

Week ended May 23, 1925:	
Number of rats trapped	2,254
Number of rats found to be plague infected	0
Number of squirrels examined	577
Number of squirrels found to be plague infected	0
Totals:	
Number of rats trapped Jan. 1 to May 23, 1925	48,081
Number of rats found to be plague infected	21
Number of squirrels examined May 1 to May 23, 1925	1,273
Number of squirrels found to be plague infected	0

Date of discovery of last plague-infected rat, Mar. 4, 1925.
Date of last human case, Sept. 10, 1919.

New Orleans, La.

Week ended May 23, 1925:	
Number of vessels inspected	341
Number of inspections made	1,018
Number of vessels fumigated with cyanide gas	22
Number of rodents examined for plague	5,658
Number of rodents found to be plague infected	0
Totals, Dec. 5, 1924, to May 23, 1925:	
Number of rodents examined for plague	108,645
Number of rodents found to be plague infected	12

Date of discovery of last plague-infected rat, Jan. 17, 1925.
Date of last human case occurring in New Orleans, Aug. 20, 1920.

TULARAEMIA IN TEXAS

Two cases of tularaemia have been reported from Texas. One case at Longview, April 29, 1925, and one at Bryan, May 5.

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

Diphtheria.—For the week ended May 23, 1925, 35 States reported 1,292 cases of diphtheria. For the week ended May 24, 1924, the same States reported 1,532 cases of this disease. One hundred and three cities, situated in all parts of the country and having an aggregate population of nearly 28,700,000, reported 845 cases of diphtheria for the week ended May 23, 1925. Last year, for the corresponding week, they reported 924 cases. The estimated expectancy for these cities was 922 cases. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Measles.—Thirty-two States reported 5,950 cases of measles for the week ended May 23, 1925, and 10,274 cases of this disease for the week ended May 24, 1924. One hundred and three cities reported 3,321 cases of measles for the week this year, and 3,713 cases last year.

Scarlet fever.—Scarlet fever was reported for the week as follows: 35 States—this year, 3,014 cases; last year, 2,716 cases; 103 cities—this year, 1,699; last year, 1,308; estimated expectancy, 940 cases.

Smallpox.—For the week ended May 23, 1925, 35 States reported 684 cases of smallpox. Last year, for the corresponding week, they reported 1,134 cases. One hundred and three cities reported smallpox for the week as follows: 1925, 329 cases; 1924, 408 cases; estimated expectancy, 118 cases. These cities reported 18 deaths from smallpox for the week this year.

Typhoid fever.—Three hundred and fifty-two cases of typhoid fever were reported for the week ended May 23, 1925, by 34 States. For the corresponding week of 1924 the same States reported 266 cases. One hundred and three cities reported 102 cases of typhoid fever for the week this year, and 78 cases for the corresponding week last year. The estimated expectancy for these cities was 66 cases.

Influenza and pneumonia.—Deaths from influenza and pneumonia (combined) were reported for the week by 103 cities, as follows: 1925, 767 deaths; 1924, 681 deaths.

City reports for week ended May 23, 1925

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence how many cases of the disease under consideration may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding week of the preceding years. When the reports include several epidemics, or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during nonepidemic years.

If reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1915 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population July 1, 1923, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine:									
Portland	73,129	2	1	0	0	0	0	13	3
New Hampshire:									
Concord	22,408	0	0	0	0	0	0	0	0
Manchester	81,383	----	1	1	----	1	1	0	2
Vermont:									
Barre	[1] 10,008	0	0	0	0	0	0	0	0
Burlington	23,613	1	1	2	0	0	3	9	4
Massachusetts:									
Boston	770,400	----	54	31	4	1	264	----	25
Fall River	120,912	9	3	1	0	0	3	2	4
Springfield	144,227	1	3	5	0	0	4	6	1
Worcester	191,927	13	4	4	0	0	47	0	2
Rhode Island:									
Pawtucket	68,799	3	1	0	0	0	1	0	2
Providence	242,378	0	11	1	1	0	4	0	3
Connecticut:									
Bridgeport	[1] 143,555	0	4	3	1	0	13	0	4
Hartford	[1] 138,036	0	6	5	0	1	5	1	2
New Haven	172,967	3	4	1	0	0	82	0	

[1] Population Jan. 1, 1920.

City reports for week ended May 23, 1925—Continued

Division, State, and city	Population July 1, 1923, estimated	Chicken pox, cases, reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
MIDDLE ATLANTIC									
New York:									
Buffalo	536,718	13	12	12	6	0	289	2	12
New York	5,927,625	214	257	335	12	16	268	0	169
Rochester	317,867	2	6	4	0	0	58	13	8
Syracuse	184,511	17	7	4	0	0	19	17	5
New Jersey:									
Camden	124,157	3	4	8	0	0	42	0	0
Newark	438,699	58	15	12	1	0	74	7	13
Trenton	127,390	5	4	1	0	0	1	0	2
Pennsylvania:									
Philadelphia	1,922,788	6	62	14	-------	3	63	3	42
Pittsburgh	613,442	45	21	10	-------	1	244	6	33
Reading	110,917	7	2	1	-------	1	162	5	0
Scranton	140,636	1	3	3	0	0	0	0	7
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	406,312	14	7	4	-------	1	1	2	9
Cleveland	888,519	95	20	43	-------	4	17	6	16
Columbus	261,082	5	3	3	0	0	12	1	2
Toledo	268,338	17	3	7	0	0	125	2	2
Indiana:									
Fort Wayne	93,573	7	2	1	0	0	7	0	3
Indianapolis	342,718	42	6	2	-------	1	24	6	8
South Bend	76,709	4	1	1	0	0	4	0	0
Terre Haute	68,939	4	0	2	-------	1	19	0	1
Illinois:									
Chicago	2,886,121	64	102	54	11	3	638	19	64
Cicero	55,968	-------	2	-------	-------	-------	-------	-------	-------
Springfield	61,833	7	1	0	3	2	28	29	1
Michigan:									
Detroit	995,668	78	46	22	7	3	30	24	32
Flint	117,968	8	4	0	0	0	22	3	5
Grand Rapids	145,947	6	2	3	-------	1	140	1	0
Wisconsin:									
Madison	42,519	2	1	0	0	-------	3	12	-------
Milwaukee	484,595	53	12	10	0	0	261	41	24
Racine	64,393	8	1	0	0	0	69	24	1
Superior	[1] 39,671	1	1	0	0	0	0	0	1
WEST NORTH CENTRAL									
Minnesota:									
Duluth	106,289	4	2	0	-------	2	0	1	1
Minneapolis	469,125	45	15	42	-------	4	50	2	4
St. Paul	241,891	43	15	18	0	0	9	14	12
Iowa:									
Sioux City	79,662	27	1	0	0	-------	0	6	-------
Waterloo	39,667	2	0	0	0	-------	2	0	-------
Missouri:									
Kansas City	351,819	20	6	3	2	2	19	22	13
St. Joseph	78,232	4	1	0	0	0	0	2	1
St. Louis	803,853	42	40	50	0	0	32	8	-------
North Dakota:									
Fargo	24,841	1	0	0	0	0	0	24	0
Grand Forks	14,547	10	0	0	0	-------	0	0	-------
South Dakota:									
Aberdeen	15,829	0	0	0	0	-------	0	0	-------
Sioux Falls	29,206	0	1	2	0	-------	0	0	-------
Nebraska:									
Lincoln	58,761	7	1	1	0	0	0	3	0
Omaha	204,382	6	3	2	0	0	1	1	4
Kansas:									
Topeka	52,555	7	1	0	0	0	3	32	1
Wichita	79,271	24	1	4	0	0	0	2	0

[1] Population Jan. 1, 1925.

City reports for week ended May 23, 1925—Continued

Division, State, and city	Population July 1, 1923, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
SOUTH ATLANTIC									
Delaware:									
Wilmington	117,728	1	1	3	0	0	19	1	2
Maryland:									
Baltimore	773,580	95	18	22	10	2	12	51	34
Cumberland	32,361	0	1	0	0	0	0	0	0
Frederick	11,301	0	0	0	0	0	0	0	0
District of Columbia:									
Washington	[1] 437,571	11	10	11	0	0	35	0	5
Virginia:									
Lynchburg	30,277	3	0	0	0	0	2	14	1
Norfolk	159,089	15	1	0	0	0	1	44	3
Richmond	181,044	3	1	2	0	0	28	4	4
Roanoke	55,502	5	1	1	0	0	8	0	1
West Virginia:									
Charleston	45,597	1	0	0	0	0	34	0	2
Huntington	57,918	0	0	0	0	----	0	0	----
Wheeling	[1] 56,208	3	1	0	0	0	18	0	3
North Carolina:									
Raleigh	29,171	10	1	0	0	0	0	0	2
Wilmington	35,719	0	0	0	0	0	0	3	1
Winston-Salem	56,230	13	0	1	0	0	2	2	3
South Carolina:									
Charleston	71,245	0	0	0	0	0	0	0	1
Columbia	39,688	0	1	1	0	----	0	8	----
Greenville	25,789	1	0	0	0	0	0	0	0
Georgia:									
Atlanta	222,963	13	1	2	24	1	0	7	0
Brunswick	15,937	0	0	0	0	0	0	1	0
Savannah	89,448	0	0	0	6	0	1	4	2
Florida:									
St. Petersburg	24,403	0	0	0	0	0	0	0	1
Tampa	56,050	----	1	0	0	0	1	----	1
EAST SOUTH CENTRAL									
Kentucky:									
Covington	57,877	0	1	1	----	1	0	0	2
Louisville	257,671	4	3	3	2	1	1	1	5
Tennessee:									
Memphis	170,037	8	2	0	----	1	9	1	7
Nashville	121,128	1	1	0	----	0	43	1	2
Alabama:									
Birmingham	195,901	8	1	3	----	3	5	2	7
Mobile	63,858	0	1	0	----	3	0	0	1
Montgomery	45,383	2	0	0	1	0	1	3	0
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	30,635	1	1	0	0	----	0	1	----
Little Rock	70,916	2	1	1	0	0	3	0	0
Louisiana:									
New Orleans	404,575	8	7	4	5	4	0	0	6
Shreveport	54,590	1	0	0	0	0	0	0	1
Oklahoma:									
Oklahoma	101,150	0	1	0	0	0	0	0	3
Texas:									
Dallas	177,274	16	3	1	0	0	0	1	3
Galveston	46,877	0	0	0	0	0	0	0	0
Houston	154,970	----	3	----	----	----	----	----	----
San Antonio	184,727	3	0	0	0	0	2	0	4
MOUNTAIN									
Montana:									
Billings	16,927	2	0	0	0	0	6	18	0
Great Falls	27,787	1	1	2	0	0	3	7	0
Helena	[1] 12,037	----	0	0	0	0	0	0	0
Missoula	[1] 12,668	0	1	0	0	0	1	0	2
Idaho:									
Boise	22,806	2	1	1	0	0	1	0	0

[1] Population Jan. 1, 1925.

City reports for week ended May 23, 1925—Continued

Division, State, and city	Population July 1, 1923, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
MOUNTAIN—continued									
Colorado:									
Denver	272,031	13	10	5	----	1	8	38	12
Pueblo	43,519	0	1	1	0	1	0	0	0
New Mexico:									
Albuquerque	16,648	0	1	0	0	0	1	6	0
Arizona:									
Phoenix	33,899	0	0	0	0	0	1	0	0
Utah:									
Salt Lake City	126,241	29	3	5	0	0	0	36	3
Nevada:									
Reno	12,429	0	0	0	0	0	0	0	1
PACIFIC									
Washington:									
Seattle	[1] 315,685	53	5	1	0	----	2	36	----
Spokane	104,573	0	2	5	0	----	0	0	----
Tacoma	101,731	4	1	1	0	0	0	2	2
California:									
Los Angeles	666,853	41	34	35	13	4	32	22	23
Sacramento	69,950	3	2	1	1	1	0	1	2
San Francisco	539,038	36	24	14	5	1	11	44	6

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
NEW ENGLAND											
Maine:											
Portland	1	5	0	0	0	0	0	0	0	2	24
New Hampshire:											
Concord	1	0	0	0	0	1	0	0	0	0	10
Manchester	1	5	0	0	0	0	0	0	0	----	23
Vermont:											
Barre	1	0	0	0	0	1	0	0	0	0	3
Burlington	1	0	0	0	0	0	0	0	0	0	12
Massachusetts:											
Boston	49	67	1	0	0	16	2	5	1	----	232
Fall River	3	4	0	0	0	4	1	1	0	0	26
Springfield	5	17	0	0	0	1	0	0	0	5	37
Worcester	7	12	0	0	0	3	0	1	0	0	35
Rhode Island:											
Pawtucket	1	3	0	0	0	0	0	0	0	0	12
Providence	10	8	0	0	0	4	0	0	0	0	59
Connecticut:											
Bridgeport	5	11	0	0	0	0	0	0	0	0	26
Hartford	3	9	0	0	0	2	0	1	0	10	34
New Haven	4	5	0	0	0	4	0	2	0	34	42
MIDDLE ATLANTIC											
New York:											
Buffalo	18	24	0	0	0	9	1	1	0	19	12
New York	196	285	0	0	0	[2] 105	11	30	2	158	1,41
Rochester	12	57	1	0	0	4	0	1	1	14	84
Syracuse	11	3	0	0	0	3	0	0	0	8	57
New Jersey:											
Camden	3	9	0	3	2	1	0	0	0	1	27
Newark	18	25	0	0	0	9	1	0	0	58	105
Trenton	2	2	0	0	0	2	0	1	0	0	33
Pennsylvania:											
Philadelphia	71	21	0	0	2	43	5	2	3	17	518
Pittsburgh	23	88	0	0	0	12	1	2	0	16	179
Reading	2	10	0	0	0	1	0	0	0	11	35
Scranton	2	3	0	0	0	1	0	0	0	2	----

[1] Population Jan. 1, 1920.

[2] Pulmonary tuberculosis only.

City reports for week ended May 23, 1925—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	10	17	2	0	0	14	1	0	1	4	124
Cleveland	19	16	1	1	0	6	2	2	0	55	184
Columbus	5	25	2	16	0	4	0	0	0	13	67
Toledo	14	11	3	1	0	4	0	0	0	37	57
Indiana:											
Fort Wayne	2	6	3	1	0	3	0	0	1	2	28
Indianapolis	14	8	6	4	0	4	1	0	0	20	85
South Bend	3	16	0	2	0	0	0	0	0	0	13
Terre Haute	3	8	0	10	0	1	0	0	0	0	21
Illinois:									1		
Chicago	68	225	2	8	1	53	3	3		98	659
Cicero	1	----	0	----	----	----	0	----	----	----	----
Springfield	2	0	1	0	0	0	1	0	0	2	16
Michigan:											
Detroit	71	127	10	0	0	16	3	2	2	122	267
Flint	5	12	2	5	0	0	1	0	0	10	20
Grand Rapids	6	66	1	0	0	1	1	0	0	1	44
Wisconsin:											
Madison	2	1	1	0	----	0	0	0	----	15	----
Milwaukee	26	13	2	46	12	10	1	0	0	25	145
Racine	5	5	1	1	0	2	0	0	0	0	10
Superior	2	12	2	1	0	1	0	0	0	0	11
WEST NORTH CENTRAL											
Minnesota:											
Duluth	4	13	1	0	0	0	0	0	0	1	17
Minneapolis	28	112	7	3	0	7	0	1	0	3	96
St. Paul	18	16	5	2	1	3	0	1	0	28	80
Iowa:											
Sioux City	3	1	1	1	----	----	0	0	----	0	----
Waterloo	2	0	1	9	----	----	0	0	----	8	----
Missouri:											
Kansas City	8	32	3	0	0	8	1	0	0	19	94
St. Joseph	2	4	1	0	0	4	0	0	0	0	30
St. Louis	29	79	1	4	0	12	2	0	0	17	217
North Dakota:											
Fargo	1	1	0	0	0	0	0	0	0	3	5
Grand Forks	1	0	1	0	----	----	0	0	----	0	----
South Dakota:											
Aberdeen	1	1	0	0	----	----	0	0	----	3	----
Sioux Falls	1	3	1	0	----	----	0	0	----	0	----
Nebraska:											
Lincoln	2	0	1	0	0	0	0	0	0	14	20
Omaha	5	3	3	14	0	2	0	0	0	2	42
Kansas:											
Topeka	1	2	0	0	0	1	0	0	0	3	13
Wichita	2	2	3	0	0	0	0	0	0	19	22
SOUTH ATLANTIC											
Delaware:											
Wilmington	3	7	0	0	0	0	0	0	0	3	27
Maryland:											
Baltimore	25	34	0	0	0	22	3	3	0	127	230
Cumberland	1	0	0	0	0	0	0	0	0	0	12
Frederick	1	1	0	0	0	0	0	0	0	0	0
Dist. of Columbia:											
Washington	16	21	2	1	0	10	2	0	1	19	106
Virginia:											
Lynchburg	1	0	0	3	0	1	0	2	0	11	7
Norfolk	1	1	0	0	0	1	1	0	0	27	----
Richmond	3	0	0	0	0	6	0	2	0	1	60
Roanoke	1	1	0	0	0	1	0	0	0	4	18
West Virginia:											
Charleston	1	1	1	0	0	3	0	0	0	1	23
Huntington	0	3	0	10	----	----	0	0	----	0	----
Wheeling	2	2	0	0	0	0	0	1	1	0	22

City reports for week ended May 23, 1925—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
SOUTH ATLANTIC—continued											
North Carolina:											
Raleigh	0	0	0	1	0	1	0	0	0	0	16
Wilmington	0	0	0	2	0	1	0	0	0	3	9
Winston-Salem	1	0	2	17	0	0	0	1	0	10	22
South Carolina:											
Charleston	0	0	1	0	0	3	0	1	0	1	26
Columbia	0	0	0	1			1	3		0	
Greenville	0	0	0	7	0	0	0	1	0	1	2
Georgia:											
Atlanta	4	2	6	0	0	5	0	5	1	14	83
Brunswick	0	0	1	0	0	2	0	0	0	0	7
Savannah	1	1	0	0	0	4	1	0	0	2	39
Florida:											
St. Petersburg	0	0	0	0	0	0	0	0	0	0	10
Tampa	0	1	0	0	0	2	1	0	0		31
EAST SOUTH CENTRAL											
Kentucky:											
Covington	1	1	0	0	0	5	1	0	0	0	21
Louisville	3	12	1	4	0	9	2	1	0	6	84
Tennessee:											
Memphis	4	6	2	15	0	6	1	5	0	23	70
Nashville	2	5	1	11	0	3	1	2	0	1	48
Alabama:											
Birmingham	1	19	1	46	0	8	2	2	0	4	75
Mobile	0	0	1	1	0	1	0	1	0	0	20
Montgomery	0	0	1	0	0	0	1	2	0	0	15
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	0	0	0	0			0	0		4	
Little Rock	1	0	1	0	0	1	0	2	0	0	
Louisiana:											
New Orleans	2	9	3	1	0	15	3	6	3	77	165
Shreveport	0	0	0	2	0	0	0	0	0	0	20
Oklahoma:											
Oklahoma	2	0	5	0	0	0	1	0	0	0	23
Texas:											
Dallas	2	0	3	16	0	2	0	2	1	8	44
Galveston	0	0	0	2	0	1	1	0	0	0	25
Houston	1		1				0				
San Antonio	1	0	0	1	0	5	1	0	0	0	46
MOUNTAIN											
Montana:											
Billings	1	0	0	0	0	0	0	0	0	0	2
Great Falls	1	14	2	0	0	0	0	0	0	4	15
Helena	1	0	1	0	0	0	0	1	0		4
Missoula	0	2	1	0	0	0	0	0	0	1	5
Idaho:											
Boise	1	0	1	2	0	0	0	0	0	4	6
Colorado:											
Denver	11	14	1	0	0	10	0	0	0	14	78
Pueblo	1	0	0	0	0	0	0	0	0	1	16
New Mexico:											
Albuquerque	1	0	0	0	0	3	0	0	0	0	9
Arizona:											
Phoenix	0	1	0	0	0	7	0	0	0	2	19
Utah:											
Salt Lake City	2	4	0	0	0	2	1	1	0	9	30
Nevada:											
Reno	1	0	0	1	0	0	0	0	0	0	5
PACIFIC											
Washington:											
Seattle	7	9	2	25			1	0		92	
Spokane	3	0	6	0			0	0		25	
Tacoma	2	6	1	8	0	0	0	0	0	1	24
California:											
Los Angeles	13	27	1	29	0	25	1	1	0	76	215
Sacramento	1	1	0	0	0	1	1	0	0	8	21
San Francisco	14	13	1	2	0	17	1	1	0	44	136

City reports for week ended May 23, 1925—Continued

Division, State and city	Cerebrospinal meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)			Typhus fever	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths	Cases	Deaths
NEW ENGLAND											
Massachusetts:											
Boston	0	1	0	0	0	0	0	0	0	0	0
Connecticut:											
New Haven	0	0	0	0	0	0	0	0	0	1	0
MIDDLE ATLANTIC											
New York:											
Buffalo	0	0	1	1	0	0	0	0	0	0	0
New York	2	2	9	3	0	0	1	0	0	0	0
Rochester	0	0	0	2	0	0	0	0	0	0	0
Pennsylvania:											
Pittsburgh	1	0	0	0	0	0	0	0	1	0	0
EAST NORTH CENTRAL											
Indiana:											
Terre Haute	1	1	0	0	0	0	0	0	0	0	0
Illinois:											
Chicago	1	0	0	0	0	0	1	0	0	0	0
Michigan:											
Detroit	3	0	0	1	0	0	0	1	0	0	0
Wisconsin:											
Milwaukee	0	0	1	1	0	0	1	0	0	0	0
WEST NORTH CENTRAL											
Missouri:											
Kansas City	0	0	0	0	1	1	0	0	0	0	0
SOUTH ATLANTIC											
Maryland:											
Baltimore	2	2	1	0	0	0	0	1	1	0	0
District of Columbia:											
Washington	0	0	1	1	0	0	0	0	0	0	0
Virginia:											
Richmond	0	1	0	0	0	1	0	0	0	0	0
North Carolina:											
Raleigh	1	0	0	0	0	0	0	0	0	0	0
South Carolina:											
Greenville	0	0	0	0	0	1	0	0	0	0	0
Georgia:											
Atlanta	0	0	0	0	0	1	0	0	0	0	0
Florida:											
Tampa	0	0	0	0	0	1	0	0	0	0	0
EAST SOUTH CENTRAL											
Tennessee:											
Memphis	0	0	0	0	1	1	0	0	0	0	0
Alabama:											
Mobile	0	0	0	0	1	0	0	0	0	0	0
Montgomery	0	0	0	0	1	0	0	0	0	0	0
WEST SOUTH CENTRAL											
Arkansas:											
Little Rock	0	0	0	0	0	1	0	0	0	0	0
Louisiana:											
New Orleans	0	0	0	0	3	2	0	0	0	0	0
Shreveport	0	0	0	0	0	2	0	0	0	0	0
Texas:											
Dallas	0	0	0	0	1	0	0	0	0	0	0
Galveston	0	0	0	0	0	2	0	0	0	0	0
San Antonio	0	0	0	0	0	1	0	0	1	0	0
PACIFIC											
Washington:											
Spokane	2	-------	0	-------	0	-------	0	0	-------	0	-------
Tacoma	3	1	0	0	0	0	0	0	0	0	0
California:											
Los Angeles	2	0	0	0	1	0	0	1	0	0	0
San Francisco	0	0	1	0	0	0	0	2	0	0	0

The following table gives the rates per hundred thousand population for 105 cities for the 10-week period ended May 23, 1925. The population figures used in computing the rates were estimated as of July 1, 1923, as this is the latest date for which estimates are available. The 105 cities reporting cases had an estimated aggregate population of nearly 29,000,000, and the 97 cities reporting deaths had more than 28,000,000 population. The number of cities included in each group and the aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, March 15 to May 23, 1925—Annual rates per 100,000 population [1]

DIPHTHERIA CASE RATES

	Week ended—									
	Mar. 21	Mar. 28	Apr. 4	Apr. 11	Apr. 18	Apr. 25	May 2	May 9	May 16	May 23
105 cities	167	[2] 168	177	158	160	162	158	[2] 157	[3] 164	[4] 154
New England	147	119	171	166	129	144	127	109	154	127
Middle Atlantic	196	231	241	220	228	218	213	212	238	203
East North Central	134	112	93	96	110	113	110	113	110	[5] 108
West North Central	199	247	220	226	168	187	201	278	[6] 212	251
South Atlantic	136	95	81	73	102	108	104	104	85	87
East South Central	69	57	23	34	46	40	40	11	34	40
West South Central	97	121	83	107	74	79	70	65	56	[7] 32
Mountain	143	134	124	105	239	267	115	105	153	134
Pacific	249	[3] 179	374	171	168	165	206	[3] 123	[8] 138	165

MEASLES CASE RATES

105 cities	506	[2] 507	558	531	589	645	581	[2] 627	[3] 624	[4] 604
New England	725	755	957	1,011	917	1,217	1,004	984	1,188	1,051
Middle Atlantic	598	633	734	680	815	782	734	797	768	617
East North Central	775	798	736	710	742	901	761	890	854	[5] 953
West North Central	93	89	77	58	91	102	79	112	[6] 80	236
South Atlantic	189	136	209	207	256	295	305	240	329	327
East South Central	69	34	69	34	97	189	200	343	166	337
West South Central	42	9	88	51	65	37	28	32	14	[7] 27
Mountain	573	38	219	57	267	219	534	181	57	181
Pacific	189	[3] 151	209	241	154	203	162	[3] 95	[8] 178	131

SCARLET FEVER CASE RATES

105 cities	427	[2] 419	409	367	342	360	309	[2] 323	[3] 352	[4] 309
New England	544	604	534	529	350	407	430	415	358	350
Middle Atlantic	417	405	436	359	343	336	323	319	331	265
East North Central	498	483	442	422	403	433	324	366	399	[5] 416
West North Central	792	755	736	647	651	692	518	618	[6] 734	556
South Atlantic	146	167	175	152	167	175	132	106	165	146
East South Central	286	286	263	280	229	257	263	263	326	246
West South Central	134	102	51	88	60	121	111	88	74	[7] 22
Mountain	429	248	277	258	315	401	334	277	353	324
Pacific	218	[3] 222	191	174	145	148	125	[3] 151	[8] 197	162

[1] The figures given in this table are rates per 100,000 population, annual basis, and not the number of cases reported. Populations used are estimated as of July 1, 1923.
[2] Spokane, Wash., not included. Report not received at time of going to press.
[3] Sioux Falls, S. Dak., and Tacoma, Wash., not included.
[4] Cicero, Ill., and Houston, Tex., not included.
[5] Cicero, Ill., not included.
[6] Sioux Falls, S. Dak., not included.
[7] Houston, Tex., not included.
[8] Tacoma, Wash., not included.

Summary of weekly reports from cities, March 15 to May 23, 1925—Annual rates per 100,000 population—Continued

SMALLPOX CASE RATES

	Week ended—									
	Mar. 21	Mar. 28	Apr. 4	Apr. 11	Apr. 18	Apr. 25	May 2	May 9	May 16	May 23
105 cities	63	[3] 58	57	51	48	62	50	[3] 46	[3] 46	[4] 60
New England	0	0	12	2	0	2	0	2	0	0
Middle Atlantic	8	7	21	10	18	12	8	6	7	2
East North Central	32	33	24	22	27	39	30	44	56	[5] 71
West North Central	102	135	87	97	85	89	75	60	[6] 80	68
South Atlantic	57	67	49	43	53	79	63	45	37	65
East South Central	646	423	42	572	395	457	435	377	189	440
West South Central	107	107	46	51	14	42	32	28	37	[7] 118
Mountain	67	19	19	19	10	29	10	48	29	29
Pacific	212	[3] 191	255	148	162	264	206	[3] 176	[8] 191	185

TYPHOID FEVER CASE RATES

105 cities	12	[3] 11	9	10	12	16	18	[3] 14	[3] 13	[4] 19
New England	30	12	5	2	7	17	10	5	12	25
Middle Atlantic	8	7	4	9	11	14	22	13	10	19
East North Central	7	3	4	6	4	7	4	9	6	[5] 5
West North Central	8	6	2	2	2	6	12	2	[6] 0	4
South Atlantic	22	12	30	20	12	14	28	28	26	39
East South Central	46	57	17	17	34	80	46	46	63	74
West South Central	23	42	32	37	56	51	51	46	79	[7] 54
Mountain	0	0	0	19	38	29	0	0	0	19
Pacific	0	[3] 28	20	9	12	23	17	[3] 9	[8] 3	6

INFLUENZA DEATH RATES

105 cities	42	33	34	27	27	30	22	15	[6] 14	[4] 14
New England	30	30	35	32	27	30	20	10	7	5
Middle Atlantic	29	22	21	16	24	17	14	10	12	11
East North Central	49	40	38	27	24	33	23	16	11	[5] 12
West North Central	42	46	39	37	50	48	31	11	[6] 11	18
South Atlantic	53	12	28	26	12	43	26	24	10	6
East South Central	120	86	69	74	80	86	51	51	80	86
West South Central	76	36	36	46	36	25	31	15	20	[7] 24
Mountain	48	38	181	86	38	76	48	19	57	19
Pacific	12	53	29	12	29	12	12	16	12	25

PNEUMONIA DEATH RATES

105 cities	217	206	204	201	192	203	167	151	[6] 127	[4] 129
New England	211	219	251	211	206	186	149	161	134	119
Middle Atlantic	217	199	215	190	204	223	206	185	143	144
East North Central	222	214	182	190	190	211	148	130	125	[5] 125
West North Central	173	166	193	228	171	136	72	77	[6] 58	79
South Atlantic	290	252	234	238	232	191	195	156	136	134
East South Central	286	269	269	343	206	286	194	160	166	137
West South Central	178	168	168	168	173	158	127	138	112	[7] 84
Mountain	172	200	162	267	210	219	124	124	162	172
Pacific	131	159	159	119	98	147	127	123	78	135

[3] Spokane, Wash., not included. Report not received at time of going to press.
[4] Sioux Falls, S. Dak., and Tacoma, Wash., not included.
[5] Cicero, Ill., and Houston, Tex., not included.
[6] Cicero, Ill., not included.
[7] Sioux Falls, S. Dak., not included.
[8] Houston, Tex., not included.
[9] Tacoma, Wash., not included.

Number of cities included in summary of weekly reports and aggregate population of cities in each group, estimated as of July 1, 1923

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases	Aggregate population of cities reporting deaths
Total	105	97	28,898,350	28,140,934
New England	12	12	2,098,746	2,098,746
Middle Atlantic	10	10	10,304,114	10,304,114
East North Central	17	17	7,032,535	7,032,535
West North Central	14	11	2,515,330	2,381,454
South Atlantic	22	22	2,566,901	2,566,901
East South Central	7	7	911,885	911,885
West South Central	8	6	1,124,564	1,023,013
Mountain	9	9	546,445	546,445
Pacific	6	3	1,797,830	1,275,841

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FOREIGN AND INSULAR

ESTHONIA

Communicable diseases—March, 1925.—During the month of March, 1925, communicable diseases were reported in the Republic of Esthonia as follows: Cerebrospinal meningitis, 1; diphtheria, 40; scarlet fever, 35; tuberculosis, 207; typhoid fever, 69; typhus fever, 2. Population, 1,107,059.

ITALY

Malta fever—Catania—Syracuse Province—April 20–May 3, 1925.—Malta fever has been reported in Italy as follows: Catania—April 27–May 3, 1925: One case; Province of Syracuse, April 20–May 3, 1925: Cases, 3.

LATVIA

Communicable diseases—March, 1925—During the month of March, 1925, communicable diseases were notified in the Republic of Latvia as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	2	Rabies	3
Chicken pox	1	Scarlet fever	262
Diphtheria	69	Smallpox	3
Dysentery	3	Typhoid fever	78
Measles	435	Typhus fever	4
Mumps (epidemic)	204	Whooping cough	122
Paratyphoid	1		

Population, estimated, 2,000,000.

MEXICO

Typhus fever—Tampico—May 29, 1925.—A case of typhus fever was reported at Tampico, Mexico, May 29, 1925.

PANAMA CANAL

Communicable diseases—April, 1925.—During the month of April, 1925, communicable diseases were notified in the Canal Zone and at Colon and Panama as follows:

Disease	Canal Zone		Colon		Panama		Non-resident		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chicken pox	5		1		31	1	3		40	1
Diphtheria					6	2			6	2
Dysentery							1		1	
Hookworm disease	1		8		44		24		77	
Leprosy		1							1	
Malaria	33	1			2		24	2	59	3
Measles					4		14		18	
Meningitis					3	3			3	3
Mumps	2						5		7	
Pneumonia [1]		3		2		12		6		23
Tuberculosis [1]		3		9		9		2		23
Typhoid fever							1		1	

[1] As many cases are not reported until death occurs, this report shows only the number of deaths.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

The reports contained in the following tables must not be considered as complete or final as regards either the lists of countries included or the figures for the particular countries for which reports are given.

Reports Received During Week Ended June 12, 1925 [1]

CHOLERA

Place	Date	Cases	Deaths	Remarks
India				Mar. 29–Apr. 11, 1925. Cases, 5,956; deaths, 3,926.
Calcutta	Apr. 12–18	55	53	Mar. 22–28, 1925: Cases, 32; deaths, 28. Delayed report.
Madras	Apr. 26–May 2	1	1	
Rangoon	Apr. 12–25	6	5	
Siam:				
Bangkok	Mar. 22–Apr. 4	3	2	

PLAGUE

Place	Date	Cases	Deaths	Remarks
Brazil:				
Bahia	Apr. 19–May 2	2	2	
Ecuador:				
Guayquil	Apr. 16–30	3	2	Rats taken: 10,583; found infected, 43.
Do	May 1–15	1	2	Rats taken: 10,038; found infected, 27.
Egypt				Apr. 30–May 6, 1925: Cases, 4 Jan. 1–May 6, 1925: Cases, 28; deaths, 18. Corresponding period, 1924—cases, 203.
Province—				
Assiout	May 2	1	1	Bubonic.
Fayoum	do	1	1	Septicemic.
Minia	May 5	2	2	Bubonic.
India				Mar. 29–Apr. 4, 1925: Cases, 10,904; deaths, 9,465.
Bombay	Apr. 12–18	10	6	
Rangoon	Apr. 12–25	58	51	
Java:				
East Java—				
Soerabaya	Mar. 26–Apr. 1	3	4	
West Java—				
Batavia	Apr. 11–17	12	12	Province.
Siam:				
Bangkok	Mar. 22–Apr. 4	7	7	
Straits Settlements:				
Singapore	Apr. 12–18	6	7	

SMALLPOX

Place	Date	Cases	Deaths	Remarks
China:				
Amoy	Apr. 19–May 2		10	Prevalent in surrounding district.
Chungking	do			Widely diffused.
Foochow	Apr. 19–25			Present.
Manchuria—				
Harbin	Apr. 29–May 5	1		
Egypt:				
Alexandria	Apr 23–29	1		
Great Britain:				
England and Wales	Apr. 18–May 9	508		
Newcastle-on-Tyne	May 10–16	2		
India				Mar. 29–Apr. 11, 1925: Cases, 13,760; deaths, 3,242.
Bombay	Apr. 12–18	40	21	
Calcutta	do	285	243	Mar. 22–28, 1925: Cases, 505; deaths, 377. Delayed report.
Karachi	Apr. 26–May 2	9	1	
Madras	do	46	22	
Rangoon	Apr. 12–25	147	79	
Indo-China:				
Saigon	Apr. 5–11	7	1	
Japan:				
Nagasaki	May 4–10	3		
Java:				
East Java—				
Soerabaya	Mar. 26–Apr. 1	31	2	
Latvia				Mar. 1–31, 1925: Cases, 3.
Malta				Apr. 16–30, 1925: Cases, 3.

[1] From medical officers of the Public Health Service, American consuls and other sources.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

Reports Received During Week Ended June 12, 1925—Continued

SMALLPOX—Continued

Place	Date	Cases	Deaths	Remarks
Mexico:				
Guadalajara	May 19-25		1	
Mexico City	May 3-9	4		Including municipalities in Federal District.
San Luis Potosi	May 17-23		1	
Poland				Feb. 22-28, 1925: Cases, 2.
Siam:				
Bangkok	Mar. 22-Apr. 4	12	3	10 of these imported.
Straits Settlements:				
Singapore	Apr. 12-18	1		
Union of South Africa:				
Orange Free State	do			Outbreaks.

TYPHUS FEVER

Bulgaria:				
Sofia	Apr. 30-May 6	1		
Egypt:				
Alexandria	Apr. 23-29	2	2	
Cairo	Feb. 26-Mar. 4	3	2	
Esthonia				Mar. 1-31, 1925: Cases, 2.
Latvia				Mar. 1-31, 1925: Cases, 4.
Mexico:				
Mexico City	May 3-9	8		Including municipalities in Federal District.
Tampico	May 29	1		
Poland				Feb. 22-28, 1925: Cases, 147; deaths, 15.

Reports Received from December 27, 1924, to June 5, 1925[1]

CHOLERA

Place	Date	Cases	Deaths	Remarks
Ceylon				June 29-Dec. 27, 1924: Cases, 14; deaths, 13. Dec. 28, 1924-Jan. 24, 1925: Cases, 24; deaths, 17.
Colombo	Nov. 16-22	1		
Do	Jan. 11-24	2	2	
India				Oct. 19, 1924, to Jan. 3, 1925: Cases, 27,164; deaths, 16,228. Jan. 4-Mar. 29, 1925: Cases, 26,127; deaths, 15,462.
Bombay	Nov. 23-Dec. 20	4	4	
Do	Jan. 18-24	1	1	
Calcutta	Oct. 26-Jan 3	59	51	
Do	Jan. 4-Mar. 21	205	164	
Do	Mar. 29-Apr. 11	101	94	
Madras	Nov. 16-Jan. 3	69	40	Reported to be epidemic May 9, 1925.
Do	Jan. 4-Mar. 7	139	99	
Do	Apr. 5-25	4	2	
Rangoon	Nov. 9-Dec. 20	9	2	
Do	Jan. 4-Apr. 11	20	13	
Indo-China				Aug. 1-Sept. 30, 1924: Cases, 14; deaths, 10. Dec. 1-31, 1924: Cases, 5; deaths, 2.
Province—				
Anam	Aug. 1-31	1	1	
Cambodia	Aug. 1-Sept. 30	6	5	
Do	Dec. 1-31	1		
Cochin-China	Aug. 1-Dec. 31	10	5	
Saigon	Nov. 30-Dec. 6	1		
Do	Mar. 15-21	1	1	
Tonkin	Dec. 1-31	1	1	
Siam:				
Bangkok	Nov. 9-29	4	2	
Do	Jan. 18-Mar. 21	8	5	

[1] From medical officers of the Public Health Service, American consuls, and other sources.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

Reports Received from December 27, 1924, to June 5, 1925—Continued

PLAGUE

Place	Date	Cases	Deaths	Remarks
Azores:				
Fayal Island—				
Castelo Branco	Nov. 25			Present with several cases.
Feteira	do	1		
St. Michael Island	Nov. 2–Jan. 3	30	13	
Do	Jan. 18–24	3	1	
Brazil:				
Bahia	Jan. 4–Apr. 18	11	7	
Santos	Year, 1924	2		Bubonic.
British East Africa:				
Tanganyika Territory	Nov. 23–Dec. 27	17	10	
Do	Jan. 18–Mar. 14	18	12	
Uganda	Aug.–Dec., 1924	279	243	
Do	Jan. 1–31	29	28	
Canary Islands:				
Las Palmas	Jan. 21–23	2		Stated to be endemic.
Do	Feb. 4	1		Stated to have been infected with plague Sept. 30, 1924.
Do	Mar. 26	1	1	
Realejo Alto	Dec. 19	3	1	Vicinity of Santa Cruz de Teneriffe.
Teneriffe—				
Santa Cruz	Jan. 3	1		In vicinity.
Celebes:				
Macassar	Oct. 29			Epidemic.
Ceylon:				
Colombo	Nov. 9–Jan. 3	12	9	
Do	Jan. 4–Apr. 14	21	21	
China:				
Foochow	Dec. 28–Jan. 3			Present.
Nanking	Nov. 23–Mar. 7			Do.
Shing Hsien	October, 1924		700	
Ecuador				Mar. 16–Apr. 15, 1925: Cases, 10; deaths, 4.
Chimborazo Province—				
Alausi District	Jan. 14		14	At 2 localities on Guayaquil & Quito Ry.
Daule	Mar. 16–31	1		
Guayaquil	Nov. 16–Dec. 31	9	3	Rats taken, 27,004; found infected, 92.
Do	Jan. 1–Apr. 15	68	29	Rats taken, 78,396; found infected, 325.
Naranjito	Feb. 16–Mar. 15	1		
Yaguachi	Feb. 1–Mar. 15	2	1	
Egypt				Year 1924: Cases, 373. Jan. 1–Apr. 29, 1925: Cases, 24; deaths, 14.
City—				
Suez	Apr. 2–22	2	2	
Province—				
Beni-Souef	Jan. 18	1	1	
Dakhalia	Jan. 7	1	1	
Fayoum	Apr. 5–14	3	2	
Girgeh	Jan. 9–Apr. 5	2	2	
Kalioubiah	Jan. 5–Apr. 22	5	2	
Menoufieh	Jan. 1–Apr. 9	8	4	
Minia	Apr. 1–5	2		
Gold Coast				September – December, 1924: Deaths, 52.
Greece:				
Patras	Apr. 5	1		
Hawaii:				
Honokaa	Nov. 4	1		Plague-infected rodents found Dec. 9, 1924, Jan. 15, Apr. 28 and 30, 1925. Vicinity Pacific Sugar Mill, Island of Hawaii.
India				Oct. 19, 1924, to Jan. 3, 1925: Cases, 28,154; deaths, 21,505. Jan. 4–Mar. 28, 1925: Cases, 57,672; deaths, 48,562.
Bombay	Nov. 22–Jan. 3	4	3	
Do	Jan. 4–17	2	2	
Do	Feb. 8–Apr. 4	56	47	
Calcutta	Jan. 18–24	1	1	
Karachi	Nov. 30–Dec. 6	2	1	
Do	Jan. 4–Feb. 21	12	11	
Do	Mar. 29–Apr. 25	6	7	
Madras Presidency	Nov. 23–Jan. 3	685	487	
Do	Jan. 4–24	658	511	
Do	Mar. 8–14	80	48	
Do	Apr. 19–25	27	16	
Rangoon	Oct. 26–Jan. 3	26	25	
Do	Jan. 4–Apr. 11	187	164	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

Reports Received from December 27, 1924, to June 5, 1925—Continued

PLAGUE—Continued

Place	Date	Cases	Deaths	Remarks
Indo-China				Aug. 1–Sept. 30, 1924: Cases, 25; deaths, 20. Dec. 1–31, 1924: Cases, 11; deaths, 11. Corresponding month, 1923: Cases, 15; deaths, 5.
Province—				
Anam	Aug. 1–Sept. 30	4	4	
Do	Dec. 1–31	5	5	
Cambodia	Aug. 1–Sept. 30	18	15	
Do	Dec. 1–31	6	6	
Cochin-China	do	3	1	
Saigon	Dec. 25–31	1	1	Including 100 square kilometers of surrounding territory.
Do	Jan. 11–17	2	1	Do.
Iraq	June 29–Jan. 3	20	14	
Bagdad	Mar. 22–28	1	1	
Japan	Aug. 10–Dec. 6	19		
Java:				
East Java—				
Blitar	Nov. 11–22			Province of Kediri. Epidemic.
Pare	Nov. 29			Do.
Samarang	Mar. 22–28	2	2	
Sidoardja	Jan. 2			Declared epidemic, Province of Soerabaya.
Soerabaya	Nov. 16–Dec. 31	71	72	
Do	Jan. 15–Mar. 25	25	22	Mar. 29–Apr. 4, 1925: 2 plague rats found.
Soerakarta	Feb. 20			Epidemic plague in one locality.
West Java—				
Cheribon	Oct. 14–Nov. 3		14	
Do	Nov. 18–Dec. 22		80	
Do	Jan. 1–14		44	
Do	Feb. 5–11		13	
Do	Feb. 19–25		13	
Do	Mar. 5–11		14	
Pasoerocan	Dec. 27			Province. Epidemic in one locality.
Pekalongan	Oct. 14–Nov. 3		29	
Do	Nov. 18–Dec. 31		177	Pekalongan Province.
Do	Jan. 1–14		81	
Do	Feb. 5–11		36	
Do	Feb. 19–25		38	
Do	Mar. 5–11		28	
Probalingga	Dec. 27			Province. Epidemic.
Tegal	Oct. 14–Dec. 31		26	
Do	Jan. 1–14		37	Pekalongan Province.
Do	Feb. 5–11		7	
Do	Feb. 19–25		10	
Do	Mar. 5–11		3	
Madagascar:				
Fort-Dauphin (port)	Nov. 1–Dec. 15	12	5	
Do	Feb. 1–15	1	1	Bubonic.
Itasy Province	Nov. 1–Dec. 15	4	2	
Do	Feb. 1–Mar. 15	6	6	
Majunga (port)	Nov. 1–30	1	1	
Moramanga Province				Nov. 1–Dec. 15, 1924: Cases, 49; deaths, 34. Jan. 16–Mar. 15, 1925: Cases, 8; deaths, 8.
Tamatave (port)	Nov. 1–30	1	1	
Tananarive Province				Oct. 16–Dec. 31, 1924: Cases, 298; deaths, 274.
Do				Jan. 1–Mar. 15: Cases, 456; deaths, 387.
Tananarive (town)	Mar. 1–15	3	3	Year 1924: Cases, 161; deaths, 144.
Mauritius Island				
District—				
Flacq	Dec. 1–31	5	4	
Pamplemousses	do	1	1	
Plaines Wilhems	January–December, 1924.	54	47	Not present March, April, May.
Port Louis	February–December, 1924.	101	92	
Mexico:				
Tampico	Apr. 6, 1925			Plague rat found in vicinity of Government wharves.
Morocco:				
Marrakech				Feb. 9, 1925: Present in native quarter of town. Stated to be pneumonic in form and of high mortality.
Nigeria				August–November, 1924: Cases, 387; deaths, 317.
Palestine:				
Jerusalem	Mar. 3–9	1		
Peru:				
Callao	February, 1925	6	6	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

Reports Received from December 27, 1924, to June 5, 1925—Continued

PLAGUE—Continued

Place	Date	Cases	Deaths	Remarks
Siam:				
Bangkok	Dec. 28-Jan. 3	1	1	
Do	Jan. 25-Mar. 21	7	6	
Siberia:				
Transbaikalia—				
Turga	October, 1924		3	On Chita Railroad.
Straits Settlements:				
Singapore	Nov. 9-15	1	1	
Do	Jan. 4-Apr. 11	30	19	
Syria:				
Beirut	Jan. 11-Apr. 10	2		
Turkey:				
Constantinople	Jan. 9-15	5	5	
Union of South Africa	Nov. 22-Jan. 3	28	15	In Cape Province, Orange Free State, and Transvaal.
Do	Jan. 4-Apr. 4	55	23	Do.
On vessels:				
S. S. Conde				At Marseille, France, Nov. 8, 1924. Plague rat found. Vessel left for Tamatave, Madagascar, Nov. 12, 1924.
Steamship	November, 1924	1	1	At Majunga, Madagascar, from Djibuti, Red Sea port.

SMALLPOX

Algeria				July 1-Dec. 31, 1924: Cases, 409.
Algiers	Jan. 1-Apr. 30	16		Jan. 1-20, 1925: Cases, 107.
Arabia:				
Aden	Jan. 25-Apr. 18	14	1	
Argentina:				
Buenos Aires	Mar. 15-21	1		
Belgium	Jan. 1-Feb. 10	4		
Bolivia:				
La Paz	Nov. 1-Dec. 21	20	11	
Do	Jan. 1-Mar. 31		12	
Brazil:				
Pernambuco	Nov. 9-Jan. 3	100	27	
Do	Jan. 4-Mar. 28	111	56	
Porto Alegre	Apr. 12-18		1	
British East Africa:				
Kenya—				
Mombasa	Jan. 18-Feb. 28	66	14	
Do	Mar. 8-28	29	7	
Tanganyika Territory	Feb. 15-21	1		
Uganda—				
Entebbe	Oct. 1-31	4		
British South Africa:				
Northern Rhodesia	Oct. 26-Dec. 15	57	2	
Do	Jan. 27-Feb. 2	3		Natives.
Do	Mar. 17-Apr. 14	9		
Southern Rhodesia	Jan. 29-Mar. 25	4	1	
Bulgaria:				
Sofia	Mar. 12-18	1		Varioloid.
Canada:				
Alberta—				
Calgary	Mar. 15-21	1		
British Columbia—				
Ocean Falls	Mar. 7-27	6		Very mild.
Vancouver	Dec. 14-Jan. 3	32		
Do	Jan. 4-Apr. 12	305		
Do	Apr. 19-May 17	16		
Victoria	Jan. 18-Apr. 25	11		
Manitoba—				
Winnipeg	Dec. 7-Jan. 3	14		
Do	Jan. 4-Feb. 27	30		
Do	Apr. 5-11	1		
New Brunswick—				
Northumberland	Feb. 8-14	1		County.
Ontario				Nov. 30-Dec. 27, 1924: Cases, 33.
Hamilton	Jan. 24-30	1		Dec. 28, 1924, to Apr. 25, 1925: Cases, 69; deaths, 1.
Kingston	Apr. 12-18	1		
Ottawa	Mar. 29-Apr. 4	1		
Do	May 3-9	2		
Welland	Mar. 22-Apr. 25	7		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

Reports Received from December 27, 1924, to June 5, 1925—Continued

SMALLPOX—Continued

Place	Date	Cases	Deaths	Remarks
Ceylon				July 27–Nov. 29, 1924; Cases, 27; deaths, 1.
Colombo	Jan. 18–Feb. 7	4		
Do	Mar. 8–Apr. 18	17	*	
China:				
Amoy	Nov. 9–Feb. 21			Present.
Do	Feb. 22–Apr. 18		19	
Antung	Nov. 17–Dec. 28	5		
Do	Jan. 5–Feb. 14	15	1	
Do	Mar. 2–Apr. 5	9	1	
Do	Apr. 12–26	5		
Canton	Mar. 15–Apr. 18			Prevalent.
Chefoo	Mar. 15–21			Prevalent. No foreign cases.
Chungking	Mar. 22–Apr. 18			Stated to be widely prevalent; less than in period in year 1924.
Foochow	Nov. 2–Apr. 18			Present.
Hongkong	Nov. 9–Jan. 3	6	2	
Do	Jan. 4–Feb. 7	9	7	
Do	Feb. 15–Apr. 4	27	13	
Manchuria—				
Dairen	Jan. 19–Apr. 25	18	3	
Harbin	Jan. 15–Apr. 21	6		
Nanking	Jan. 4–Apr. 18			Prevalent.
Shanghai	Dec. 7–27	1	2	
Do	Jan. 18–Mar. 7		8	
Do	Apr. 12–25	2	1	
Chosen:				
Seoul	Dec. 1–31	1		
Do	Mar. 1–31	2		
Colombia:				
Buenaventura	Feb. 15–Apr. 4	3		
Santa Marta	Mar. 15–28			Present in mild form in localities in vicinity.
Cuba:				
Santiago	Apr. 12–18	3	1	
Czechoslovakia				Apr.–June, 1924: Cases, 1; occurring in Province of Moravia.
Dominican Republic:				
Puerta Plata	Mar. 8–21	3		
Dutch Guiana:				
Paramaribo	Apr. 20	1		
Ecuador:				
Guayaquil	Nov. 16–Dec. 15	4		
Egypt:				
Alexandria	Nov. 12–Dec. 31	10		
Do	Jan. 8–28	8		
Do	Feb. 26–Mar. 4	1		
Cairo	Jan. 29–Feb. 4	1	1	
Esthonia				Dec. 1–31, 1924: Cases, 2.
France				July–December, 1924: Cases, 81.
Do	January, 1925	10		
Boulogne-Sur-Mer	Apr. 1–30	1	1	
Dunkirk	Mar. 2–8	1		From vessel. In quarantine.
St. Malo	Feb. 2–8	7	1	Believed to have been imported on steamship Ruyth from Sfax, Tunis.
Germany				June 29–Nov. 8, 1924: Cases, 7.
Frankfort-on-Main	Jan. 1–10	1		
Gibraltar	Dec. 8–14	1		
Do	May 4–10	2		
Gold Coast				July–December, 1924: Cases, 106; deaths, 1.
Great Britain:				
England and Wales	Nov. 23–Jan. 3	472		
Do	Jan. 4–Apr. 18	2,047		
Newcastle-on-Tyne	Jan. 18–Feb. 21	9		
Do	Mar. 1–May 9	5		
Greece				January–June, 1924: Cases, 170; deaths, 27.
Do				July–December, 1924: Cases, 38; deaths, 26.
Saloniki	Nov. 11–Dec. 22	3		
Do	Feb. 17–Mar. 2	4		
Haiti:				
Cape Haitien	Mar. 22–Apr. 2	6		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

Reports Received from December 27, 1924, to June 5, 1925—Continued

SMALLPOX—Continued

Place	Date	Cases	Deaths	Remarks
India				Oct. 19, 1924, to Jan. 3, 1925: Cases, 12,564; deaths, 2,857. Jan. 4–Mar. 28, 1925: Cases, 54,626; deaths, 12,494.
Bombay	Nov. 2–Jan. 3	30	18	
Do	Jan. 4–Apr. 4	601	307	
Calcutta	Oct. 26–Jan. 8	307	170	
Do	Jan. 4–Mar. 21	2,669	1,875	
Do	Mar. 29–Apr. 11	796	573	
Karachi	Nov. 16–Jan. 3	16	2	
Do	Jan. 4–Feb. 14	52	6	
Do	Feb. 22–Apr. 25	90	25	
Madras	Nov. 16–Jan. 3	122	48	
Do	Jan. 4–Mar. 7	552	212	
Do	Mar. 15–Apr. 25	553	224	
Rangoon	Oct. 26–Jan. 3	86	28	
Do	Jan. 4–Feb. 7	287	49	
Do	Feb. 15–Apr. 11	1,121	225	
Indo-China				Aug. 1–Sept. 30, 1924: Cases, 223; deaths, 76. Dec. 1–31, 1924; Cases, 485; deaths, 114.
Province—				
Anam	Aug. 1–Sept. 30	49	11	
Do	Dec. 1–31	167	26	
Cambodia	Aug. 1–Sept. 30	40	9	
Do	Dec. 1–31	30	13	
Cochin-China				Aug. 1–Sept. 30, 1924: Cases, 115; deaths, 49. Dec. 1–31, 1924: Cases, 50; deaths, 13.
Saigon	Nov. 16–Jan. 3	17	5	Including 100 square kilometers of surrounding country.
Do	Jan. 4–Feb. 21	32	8	
Do	Mar. 1–Apr. 4	48	8	Do.
Tonkin	Aug. 1–Sept. 30	19	7	
Do	Dec. 1–31	238	62	
Iraq	June 29–Jan. 10	138	67	
Do	Jan. 11–20	4	2	
Bagdad	Nov. 9–Dec. 27	2	1	
Do	Mar. 1–28	2		
Italy				June 29–Dec. 27, 1924: Cases, 63.
Jamaica				Nov. 30, 1924–Jan. 3, 1925: Cases, 50. Reported as alastrim.
Do				Jan. 4–Apr. 25, 1925: Cases, 275. Reported as alastrim.
Kingston	Nov. 30–Dec. 27	4		Reported as alastrim.
Japan				Aug. 1–Nov. 15, 1924: Cases, 4.
Nagasaki	Feb. 9–Apr. 26	31	9	
Taihoku	Apr. 4–10	1		
Taiwan	Jan. 1–31	1		
Java:				
East Java—				
Pasoerocan	Oct. 26–Nov. 1	9	1	
Do	Nov. 12–19			Epidemic in 2 native villages.
Soerabaya	Oct. 19–Dec. 31	685	212	
Do	Jan. 15–Mar. 25	559	78	
West Java—				
Batam	Oct. 14–20	2		
Batavia	Oct. 21–Nov. 14	2		
Do	Dec. 20–Jan. 2	19	4	
Buitenzorg	Dec. 25–31	1		Batavia Residency.
Cheribon	Oct. 14–Nov. 24	15		
Do	Jan. 1–28	3		
Krawang	Jan. 15–21	1		
Pekalongan	Oct. 14–Nov. 24	22		
Do	Dec. 25–31	3		Province.
Pemalang	Jan. 8–14	1		Pekalongan Residency.
Preanger	Nov. 18–24	1		
Latvia				Oct. 1–Nov. 30, 1924: Cases, 5. Jan. 1–Feb. 28, 1925: Cases, 6.
Lithuania				Jan. 1–31, 1925: Cases, 2.
Malta				Apr. 1–15, 1925: Cases, 3.
Mexico:				
Chiapas (State)	Mar. 1			Reported severely prevalent.
Durango	Dec. 1–31		5	
Do	Jan. 1–Apr. 30		29	
Guadalajara	Dec. 23–29		1	
Do	Jan. 6–Mar. 23		4	
Do	Apr. 21–May 18		14	
Mexico City	Nov. 23–Dec. 27	5		
Do	Jan. 11–May 2	69		
Monterey				Jan. 24, 1925: Outbreak. Mar. 14, 1925, present.
Oaxaca (State)	Mar. 1			Reported severely prevalent.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

Reports Received from December 27, 1924, to June 5, 1925—Continued

SMALLPOX—Continued

Place	Date	Cases	Deaths	Remarks
Mexico—Continued.				
Salina Cruz	Dec. 1-31	1	1	
Do	Feb. 22-Mar. 31	7	1	
Saltillo	Feb. 22-Apr. 11		2	
San Luis Potosi	Mar. 29-May 9		4	
Tampico	Dec. 11-31	5	4	
Do	Jan. 1-Apr. 30	66	20	
Torreon	Apr. 1-30	1	1	
Tuxpam district	Apr. 17-May 7	20	3	
Vera Cruz	Dec. 1-Jan. 3		10	
Do	Jan. 5-Apr. 19		39	
Villa Hermosa	Dec. 28-Jan. 10			Present. Locality, capital, State of Tabasco.
Yucatan (State)	Apr. 5-11			In country towns.
Nigeria				January-June, 1924: Cases, 357; deaths, 87.
Do				July-November, 1924: Cases, 87; deaths, 25.
Paraguay:				
Asuncion	Jan. 4-10		1	
Persia:				
Teheran	Sept. 23-Dec. 31		12	
Do	Jan. 1-Mar. 19		19	
Peru:				
Arequipa	Nov. 24-30		1	
Do	Jan. 1-Feb. 28		4	
Philippine Islands:				
Manila	Mar. 29-Apr. 4	3		
Poland				Sept. 21-Dec. 28, 1924: Cases, 30; deaths, 2. Jan. 4-Feb. 14, 1925: Cases, 15; deaths, 1.
Portugal:				
Lisbon	Dec. 7-Jan. 3	17		
Do	Jan. 4-Apr. 25	140		Jan. 4-Apr. 18, 1925: Deaths, 35.
Oporto	Nov. 30-Dec. 27	3	2	
Do	Jan. 11-Mar. 14	3		
Do	Apr. 12-25	2		
Russia				January-June, 1924: Cases, 18,229. July-November, 1924: Cases, 3,665.
Senegal:				
Dakar	Mar. 16-22	4		
Siam:				
Bangkok	Dec. 28-Jan. 3	1	1	
Do	Jan. 18-Feb. 21		19	
Do	Mar. 1-21	11	4	
Sierra Leone:				
Freetown	Feb. 7-Mar. 15	3		
Kaiyima	Mar. 9-15	1		
Spain:				
Barcelona	Nov. 27-Dec. 31		5	
Do	Mar. 19-25		1	
Cadiz	Nov. 1-Dec. 31		51	
Do	Jan. 1-Feb. 28		10	
Madrid	Year 1924		40	
Do	January-February		13	
Malaga	Nov. 23-Jan. 3		97	
Do	Jan. 4-May 9		102	
Valencia	Nov. 30-Dec. 6	2		
Do	Feb. 15-May 2	6		
Straits Settlements:				
Singapore	Feb. 22-Apr. 4	4	1	
Switzerland:				
Berne	Mar. 15-Apr. 18	5		
Lucerne	Nov. 1-Dec. 31	19		
Do	Jan. 1-31	24		
Syria:				
Aleppo	Nov. 23-Dec. 27	13		
Do	Jan. 4-Feb. 28	71	18	
Beirut	Feb. 11-20	1		
Do	Apr. 1-10	1		
Damascus	Jan. 6-13	2		
Do	Feb. 11-20	22		
Tripoli:				
Tripoli	July 14-Jan. 2	53		
Tunis:				
Tunis	Nov. 25-Dec. 29	42	35	
Do	Jan. 1-Apr. 22		325	
Do	Apr. 30-May 6		13	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

Reports Received from December 27, 1924, to June 5, 1925—Continued

SMALLPOX—Continued

Place	Date	Cases	Deaths	Remarks
Turkey:				
Constantinople	Dec. 13-19	5		
Do	Mar. 16-Apr. 30	8	1	
Union of South Africa				Nov. 1-Dec. 31, 1924: Cases, 14. Jan. 1-31, 1925: Cases, 4—natives. Mar. 1-31, 1925: Cases, 9; white, 3; native, 6.
Cape Province	Feb. 1-21			Outbreaks.
De Aar District	Jan. 25-31			Outbreak at railway camp.
Do	Nov. 9-Jan. 17			Outbreaks.
Natal	Mar. 1-7			Do.
Orange Free State	Nov. 2-8			Do.
Ladybrand District	Jan. 15-31			Outbreak on farm.
Transvaal	Nov. 9-Jan. 10			Do.
Do	Feb. 1-21			Outbreaks.
Uruguay				January-June, 1924: Cases, 101; deaths, 2.
Do				July-November, 1924: Cases, 53; deaths, 5.
Yugoslavia	Year 1924	330	64	
Do	Jan. 1-Feb. 28	6	1	
Belgrade	Mar. 1-Apr. 7	6		
On vessel:				
S. S. Eldridge	Mar. 23	1		At Port Townsend, from Yokohama and ports.
S. S. Habana	Feb. 18	1		At Santiago de Cuba, from Kingston, Jamaica.
S. S. Ruyth				At St. Malo, France, January, 1924, from Sfax, Tunis; believed to have imported smallpox infection.

TYPHUS FEVER

Algeria				July 1-Dec. 20, 1924: Cases, 101; deaths, 14.
Algiers	Nov. 1-Dec. 31	5	1	
Do	Jan. 1-Apr. 20	14	7	In villages, department of Algiers: Cases, natives, 24; Europeans, 3.
Argentina:				
Rosario	Jan. 1-31		1	
Bolivia:				
La Paz	Nov. 1-Dec. 31	3		
Do	Jan. 1-31	2		
Do	Mar. 1-31	1		
Bulgaria				January-June, 1924: Cases, 191; deaths, 28.
Do				July-October, 1924: Cases, 5.
Chile:				
Concepcion	Nov. 25-Dec. 1		1	
Do	Jan. 6-12		2	
Do	Jan. 27-Feb. 2		1	
Do	Apr. 14-20		1	
Iquique	Nov. 25-Dec. 1		2	
Do	Feb. 1-Mar. 28		2	
Talcahuano	Nov. 16-Dec. 20		5	
Do	Jan. 4-10		1	
Valparaiso	Nov. 25-Dec. 7		4	
Do	Jan. 11-Mar. 28		17	
Do	Apr. 5-25		3	
China:				
Antung	Mar. 16-22	1		
Manchuria—				
Harbin	Apr. 8-14	1		
Chosen:				
Chemulpo	Feb. 1-28	1		
Seoul	Nov. 1-30	1	1	
Do	Feb. 1-Mar. 31	6	2	
Czechoslovakia				December, 1924: Cases, 5.
Do	Jan.-Mar.	68	2	
Egypt:				
Alexandria	Dec. 3-9	1	1	
Do	Mar. 12-Apr. 8	2		
Cairo	Oct. 1-Dec. 23	13	8	
Do	Jan. 22-28	1		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

Reports Received from December 27, 1924, to June 5, 1925—Continued

TYPHUS FEVER—Continued

Place	Date	Cases	Deaths	Remarks
Esthonia				Dec. 1–31, 1924: Cases, 5.
Do	Jan. 1–31	4		
France				July–October, 1924: Cases, 7.
Gold Coast				Oct. 1–31, 1924: 1 case.
Greece				May–June, 1924: Cases, 116; deaths, 8.
Do				July–December, 1924: Cases, 40; deaths, 4.
Athens	Feb. 1–Apr. 10		10	
Saloniki	Nov. 17–Dec. 15	3	2	
Do	Jan. 25–31	1		
Do	Mar. 31–Apr. 20	2		
Japan				Aug. 1–Nov. 15, 1924: Cases, 2.
Latvia				October–December, 1924: Cases, 30. Feb. 1–28, 1925: Cases, 11.
Lithuania				August–October, 1924: Cases, 15; deaths, 1.
Do				Jan 1–31, 1925: Cases, 27; deaths, 2.
Mexico:				
Durango	Dec. 1–31		1	
Do	Mar. 15–Apr. 30	1	2	
Guadalajara	Dec. 23–29		1	
Mexico City	Nov. 9–Jan. 3	80		Including municipalities in Federal District.
Do	Jan. 11–May 2	105		
San Luis Potosi	Mar. 8–14		1	
Do	Apr. 26–May 2		1	
Morocco				November, 1924: Cases, 5.
Palestine				Nov. 12–Dec. 29, 1924: Cases, 10.
Ekron	Dec. 23–29	1		
Jerusalem	do	2		
Do	Jan. 20–26	1		
Mikveh Israel	do	1		
Petach-Tikvah	Mar. 24–30	1		
Ramleh	Feb. 10–Mar. 23	2		
Tiberias	Feb. 24–Mar. 2	2		
Peru:				
Arequipa	Nov. 24–Dec. 31		3	
Do	Mar. 1–31		1	
Poland				Sept. 28, 1924–Jan. 3, 1925: Cases, 751; deaths, 57. Jan. 4–Feb. 11, 1925: Cases, 827; deaths, 68.
Portugal:				
Lisbon	Dec. 29–Jan. 4		2	
Do	Apr. 6–12		1	
Oporto	Jan. 4–Feb. 7	2		
Rumania				January–June, 1924: Cases, 2,906; deaths, 328.
Do				July–December, 1924: Cases, 288; deaths, 38.
Constanza	Dec. 1–20	1		
Do	Feb. 1–28	2		
Russia				Jan. 1–June 30, 1924: Cases, 95,682. July–November, 1924: Cases, 34,729.
Leningrad	June 29–Nov. 22	12		
Spain:				
Madrid	Year 1924		3	
Malaga	Dec. 21–27		1	
Sweden:				
Goteborg	Jan. 18–Feb. 28	2		
Tunis				July 1–Dec. 20, 1924: Cases, 40.
Tunis	Mar. 5–25	9	1	
Do	Apr. 2–May 6	25	5	
Turkey:				
Constantinople	Nov. 15–Dec. 19	6	1	
Do	Jan. 2–Apr. 30	10	1	
Union of South Africa				Nov. 1–Dec. 31, 1924: Cases, 345; deaths, 87. Jan. 1–Mar. 31, 1925: Cases, 200; deaths, 24; native. In white population, cases, 12.
Cape Province	Nov. 1–Dec. 31	126	24	
Do	Jan. 1–Mar. 31	91	12	
East London	Nov. 16–22	1		
Do	Jan. 18–Apr. 4	3	2	
Port Elizabeth	Feb. 22–Mar. 7	1	1	
Natal	Nov. 1–Dec. 31	130	50	
Do	Jan. 1–Feb. 28	43	5	
Do	Mar. 1–31	6	2	
Durban	Feb. 15–Mar. 28	4		
Orange Free State	Nov. 1–Dec. 31	59	8	
Do	Jan. 1–Mar. 31	41	5	
Transvaal	Nov. 1–Dec. 31	30	5	
Do	Jan. 1–Mar. 31	14		
Yugoslavia				Year 1924: Cases, 319; deaths, 22. Jan. 1–Feb. 28, 1925: Cases, 87; deaths, 8.
Belgrade	Nov. 24–Dec. 28	5		
Do	Apr. 8–30	4		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

Reports Received from December 27, 1924, to June 5, 1925—Continued

YELLOW FEVER

Place	Date	Cases	Deaths	Remarks
Gold Coast	October-November, 1924.	4	4	
Salvador:				
San Salvador	June-October, 1924.	77	28	Last case, Oct. 22, 1924.